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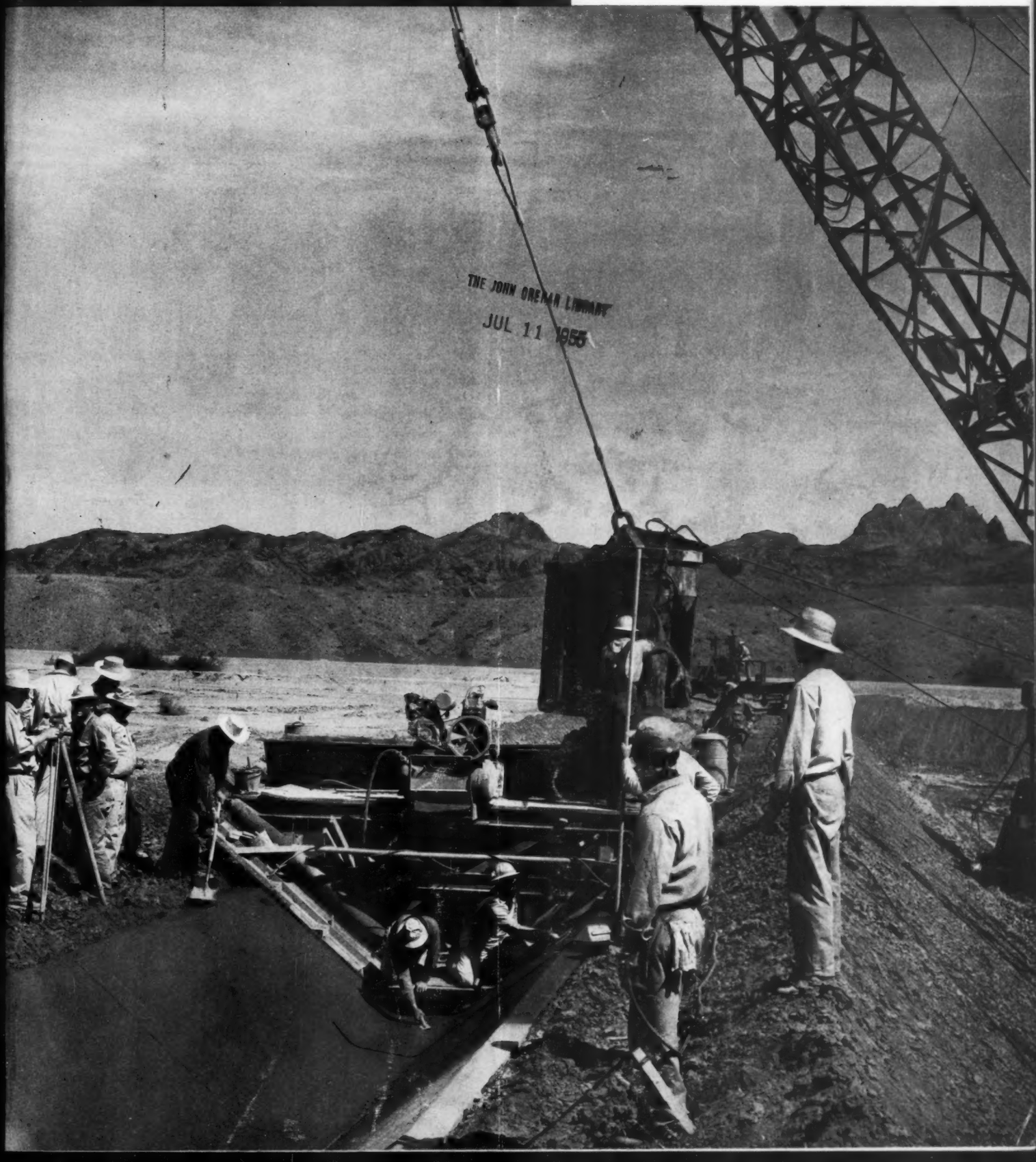
Contractors and Engineers

magazine of modern construction

JULY 1955

...e for an irrigation canal in Arizona is placed in a ...o slip-form paver from a Gar-Bro 2-yard bucket, while concrete finishers at the rear of the machine trowel the new lining. A Quincy compressor supplies air to the four Viber vibrators carried on the rig. *Page 64.*



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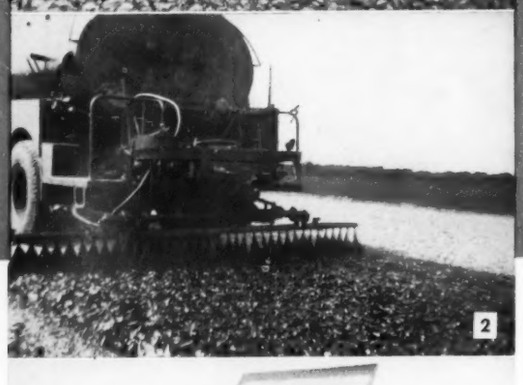

General Contractor: HARRY C. ERB, INC., Bala, Pa.
Asphalt Contractor: ASPHALT INDUSTRIES, INC., Chester, Pa.

Pennsylvania paved this highway with

asphalt penetration macadam

Where satisfactory stone is available, as in Pennsylvania, Texaco Asphalt Macadam constructed by the penetration method is an ideal answer to the road builder's need for a heavy-duty pavement. In the project illustrated here, Texaco Asphalt Macadam is used to pave a highway link between two of Pennsylvania's principal traffic arteries, U. S. Routes 1 and 13.

In Asphalt Macadam construction, coarse broken stone is laid on the prepared base to the desired thickness, then penetrated by a hot application of Texaco Asphalt Cement. Succeeding applications of smaller stone and asphalt fill the voids in the surface course, forming a waterproof, highly skid-resistant surface. The result is a resilient, rugged pavement, capable of withstanding heavy impact for many years with a low maintenance cost.

Helpful detailed information regarding Texaco Asphalt Macadam is supplied in one of the two free asphalt booklets which can be obtained without obligation by writing our nearest office. These booklets also describe the various other heavy-duty, intermediate and low-cost types of road and street construction obtainable with Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils.

PHOTOGRAPHS

(1) Compacted layer of coarse broken stone, ready for application of asphalt, in construction of Texaco Asphalt Macadam pavement.

(2) Applying hot Texaco Asphalt Cement to broken stone at the rate of 1.75 gallons per square yard.

(3) Spreading small stone to fill the voids in layer of large stone, following applications of asphalt.

(4) Pressure distributor applies one of the two asphalt seal coats used in Asphalt Macadam construction.

(5) Completed Texaco Asphalt Macadam pavement on this Pennsylvania highway, which is ready for traffic immediately.

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TEXACO ASPHALT

Contractors and Engineers

magazine of modern construction

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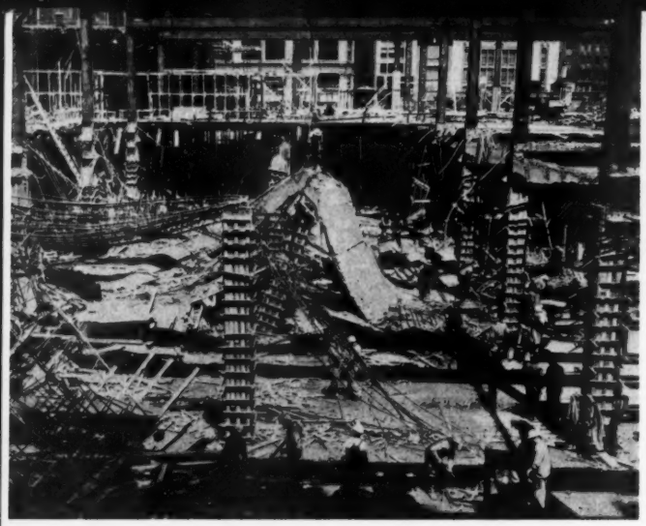


EDITORIAL

Make the forms safe too

Despite the forward strides the construction industry is making in improved techniques, occasional accidents still plague the builders. These mishaps serve as a grim reminder that safety must not be overlooked when jobs are being planned and executed. This spring during a concrete floor pour on New York City's new huge Coliseum, the formwork collapsed killing one man and injuring 53 others. Not until two days afterward was the victim's body found, encased in concrete deep in debris.

The collapsed section, over 15,000 square feet in area, was being built as the floor of the main exhibition hall when it crashed 22 feet to the street level. The metal pan and plywood forms being used were supported by a double tier of shores—wooden posts on the bottom carrying planks on which rested a set of metal screw-type jacks.

This type of formwork has been used in countless thousands of concrete pours without incident. Yet in a few cases, similar accidents have occurred when concrete was being placed in this manner. On one job, for instance, as concrete was being poured on one level, some spilled over the forms and struck a worker pushing a wheelbarrow on the level below. While dodging to avoid the falling concrete, the man rammed his wheelbarrow into the vertical shores and dislodged a couple of them. This set up a chain reaction that brought down the entire floor area under construction.

If formwork can be affected by such comparatively light external forces, it has no place on a construction project where it might have to withstand blows from equipment, explosive blasts, sudden temperature changes or other job vagaries. The precision and painstaking care that go into the design of the structure itself must also be employed in the design and construction of the formwork used in building the structure. Only then can such tragic construction accidents be avoided.

Reversing the trend

For the past decade, budgets for public-works projects have been computed and set, only to demand drastic revision as cost factors made the price of a job spiral upward during construction. Final costs on many jobs have sometimes been discouragingly high. But on page 16 in this issue, CONTRACTORS AND ENGINEERS reports on a job which reversed this trend.

The job of constructing five reinforced-concrete storage igloos at Luke Air Force Base in Arizona, was set to be done by Vinson Construction Co., Phoenix, Ariz., at a contract price of $17,052.67 for each structure. Seeing a way to get as good a job at less cost, the firm suggested to the U. S. Army Corps of Engineers that the igloos be constructed by the gunite method rather than with poured concrete. The Los Angeles Engineer District secured approval for a change order, and the igloos were built at a cost of $15,191.54, each, a saving of $1,861.13 per unit or $9,305.65 on the whole job.

Though the net saving on each igloo is only a drop in the bucket as far as the total military appropriations of the Los Angeles Engineer District is concerned, it is heartening to see that Vinson Construction Co. still puts considerable emphasis on saving money for its client. And it is also good to know that the U. S. Army Corps of Engineers still has men with sufficient vision to see that a plan can sometimes be changed to the advantage of the government and the taxpayer.

NEWS AND VIEWS

Ever since President Eisenhower announced his "grand plan" for a 10-year road-construction program there has been a considerable amount of speculation as to what the program would actually look like after going through both House and Senate. The federal-aid highway bill amending S.1048 as introduced by Sen. Albert Gore (D., Tenn.) authorizes $12.25 billion to be spent for roads in a five-year period starting with the 1956 fiscal year. Of this amount, $7,750 million reserved for the interstate system represents 90 per cent of its cost. The remainder will come from the states in matching funds.

This feature marks a big break with the traditional sharing of costs by federal and state governments on a 60-40 basis, respectively.

Except for funds earmarked for interstate road construction, more money is provided under the Senate bill than House bill, H.R. 4260. The Senate bill will provide $2 billion for primary highways, $1.5 billion for secondary highways, and $1 billion for urban highways annually.

Though much less bold than Eisenhower's original plan, the Senate bill should stifle objections to the "installment plan" method of financing advocated by the President and incorporated into H. R. 4260. This would authorize a Federal Highway Corporation to issue 30-year bonds for $21 billion to be spent in 10 years on interstate highways alone. The Senate bill proposes to finance the program entirely within the national debt limit.

One of the most objectionable parts of the Eisenhower program from a political point of view—the fact that it did not provide an increase over the $420 million combined federal and state funds for farm-to-market roads—is also making the Gore bill popular to the public and civic officials.

The table below, figured in millions of dollars, shows how the Senate bill, House bill, and the 1954 highway act compare in the average annual apportionment of federal and state funds for the several road systems:

	FEDERAL-AID ACT of 1954	ADMINISTRATION BILL (H.R. 4260) (in millions of dollars)	GORE BILL (as amended) S. 1048
INTERSTATE SYSTEM			
Federal	175	2,500	1,550
State	116.7	116.7	172
	291.7	2,616.7	1,722
PRIMARY SYSTEM			
Federal	315	315	400
State	315	315	400
	630	630	800
URBAN SYSTEM			
Federal	175	75	200
State	175	75	200
	350	150	400
SECONDARY SYSTEM			
Federal	210	210	300
State	210	210	300
	420	420	600
ALL SYSTEMS			
Federal	875	3,100	2,450
State	816.7	716.7	1,072
	1,691.7	3,816.7	3,522

Crews set bridge section in place in eight hours

About eight hours after the start of operations, the new Pennsylvania Railroad bridge section is being prepared for rail traffic. The B&O tracks lying in the right-of-way of the Penn-Lincoln Parkway will be moved under the new section, away from the Monongahela River.

Work on the final segment of the Penn-Lincoln Parkway in Pittsburgh, Pa., set up a virtual chain reaction in construction. First the B&O railroad tracks on the road's right-of-way had to be relocated away from the edge of the Monongahela River. But the piers of a Pennsylvania railroad bridge, which spanned the right-of-way and the strip on which the B&O tracks were to be relocated, made it impossible to move the B&O tracks until a new bridge section was constructed and set in place.

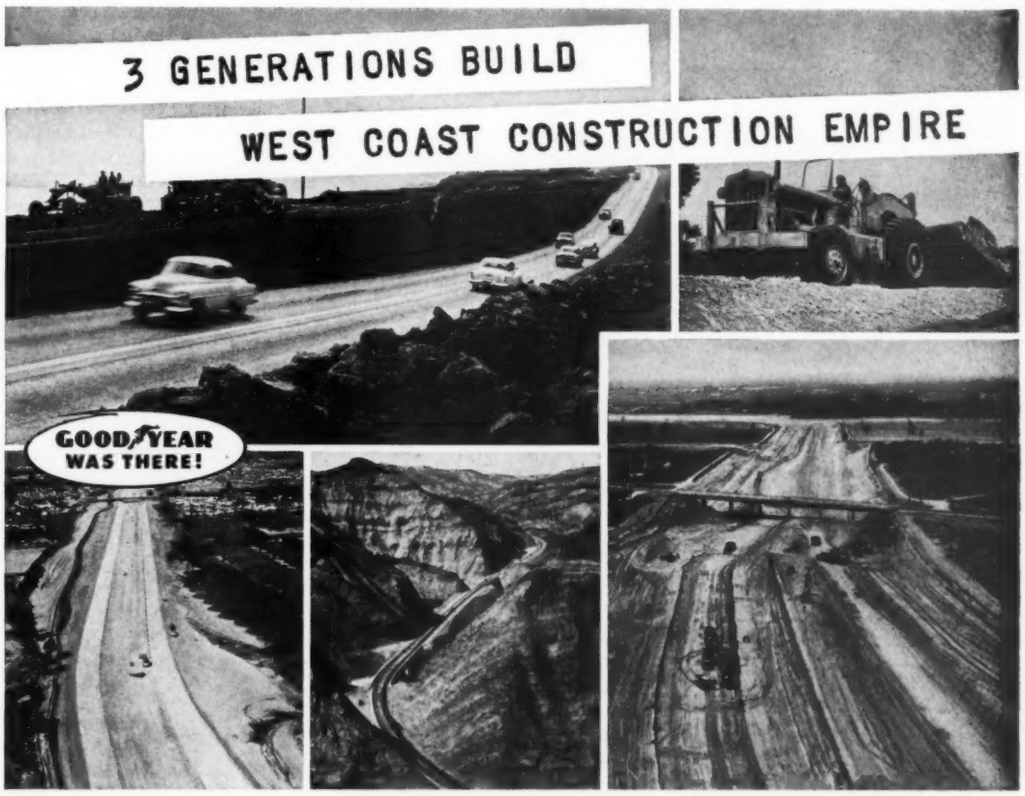
Work on the $600,000 project was begun by the Eichleay Corp., Pittsburgh, when the new bridge section was delivered to the site and set on falsework by a crane so that it paralleled the old section. The falsework, built over rollers on special tracks, had space for 64 Duff-Norton 50 and 75 to 100-ton jacks to lower the new section into place.

The old section was jacked up with 58 Duff-Norton ball-bearing screw jacks, which were also on a platform over rollers. Once the weight of this section was taken by the jacks, the old columns were cut.

Then 2-inch cables from three double-drum hoists were run under the bridge and connected to the new section. After a final check, the cables were winched in. As the new section moved one foot, it pushed the old section out of the way. The longest move made under this procedure was four feet, and the entire job of positioning the new section was done in two hours.

Fractional adjustments of the new section were made at specific points by Duff-Norton jacks placed horizontally on the tracks against the blocks. When the pins were over the shoes, the new section was lowered by the jacks, and pin plates were bolted without any further adjustment. The entire operation was completed in one day and interrupted rail traffic on the Pennsylvania line for only eight hours. THE END

Duff-Norton jacks lower the new section the final 6½ inches, permitting pin plates to be bolted on the new concrete piers.



Starting 76 years ago, as a small contractor, Adolph Teichert built the versatile organization that has what it takes to lick the big ones pictured above. Today, when you see a giant West Coast job—quarrying, earth-moving, road, rail bed, military base or dam building—it's a fair bet that A. Teichert & Son, Inc., have a hand in it! Earthmover shown above has Goodyear Hard Rock Rib tires on front wheels, Hard Rock Lug on rear.

Longest-lived tires in any generation are built with 3-T NYLON CORD!

A GOODYEAR EXCLUSIVE, 3-T NYLON CORD can *obsolete* your present tire-cost calculations. It makes Goodyear tires so durable that bruise-breaks and heat-blowouts are close to the vanishing point. Ply separation and flex failure have also been virtually eliminated—keeping bodies in shape for many more re-lugs and recaps. In fact, 3-T NYLON CORD has ADDED so much to Goodyear tire life—and SUBTRACTED so much from operating costs—that it's simply good business to try Goodyear 3-T Nylons on your toughest operations!

Goodyear Truck Tire Dept., Akron 16, Ohio

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE BUILT WITH 3-T NYLON CORD

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MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

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Look for this sign; there's a Goodyear Dealer near you.

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After roadside ditches have been excavated, a Marion 362 dragline with 85-foot boom uses a Hendrix lightweight bucket to cast material to a spoil bank as it excavates about half the peat from the roadway.

C&E Staff Photos

Blacktop pavement laid on backfilled swamp

Granular backfill material is hauled 15 miles to the site and deposited after peat is partly excavated from right-of-way

Cutting through a cypress swamp, where elevation is 1 to 3 feet below sea level, where 8 to 12 feet of organic peat soil overlays a plastic clay subsoil, and where the nearest supply of granular material is more than 15 miles distant, T. L. James & Co., Inc., Kenner, La., has completed a modern 9-mile section of highway.

Built under a $2,600,000 contract with the Jefferson Parish Police Jury and designed and supervised by Palmer & Baker, Inc., Mobile, Ala., and New Orleans, La., the stretch is part of Louisiana's Veterans Memorial Highway. This road will eventually link the New Orleans expressway system with the Lake Pontchartrain Causeway now under construction. Though the entire project is planned as a divided highway, only about two miles of divided road was built under James' contract. For the balance of the stretch, only one roadway was constructed at this time.

The newly completed section also serves to connect New Orleans with Jefferson Parish, just to the west. This area, until recently a dense cypress swamp, is being developed rapidly to absorb the population of the expanding New Orleans metropolitan area. The current building boom in the parish was made possible when it was found that structures could economically be supported on piles

Before the bituminous pavement is laid, a Grace traction-powered boom pulled by a Ford tractor sweeps the primed base. Surfacing is done 3 to 10 days after the base is primed.

One of the two Barber-Greene finishers working almost side by side to insure a hot joint receives a batch of bituminous mix from a Ford T700 tandem-axle truck. The two finishers handled the asphalt plant's 120-ton-per-hour production.

A Galion 8 to 10-ton tandem roller at work at a T intersection with the new road. The new stretch of road is part of Louisiana's Veterans Memorial Highway. T. L. James & Co., Inc., Kenner, La., had the contract.

One of the box culverts for the drainage canal between the divided roadway is built between temporary earth dams. During construction, the water flow is handled through a Fairbanks, Morse pump powered by a GM diesel engine.

A Caterpillar No. 12 motor grader, shouldering a 10-foot-wide section along the road, is given an assist by a Michigan 125 tractor-loader using a tow cable to help the grader over a tough section.

penetrating the sand strata below the swamp. Now, drainage canals, built to lower the ground water level, lead surface drainage to pumping stations which discharge water over dikes into Lake Pontchartrain or the Mississippi.

Canal divides roadway

One of these canals runs down the center of the right-of-way of the new roadway, which has a concrete curb and gutter on the property side, a 24-foot-wide paved roadway, and a shoulder of variable width adjacent to the canal. Where the canal leaves the highway alignment, a 24-foot grass median separates the paved roadways. The pavement here has 10-foot shoulders on the outside. Roadside ditches have 3 to 1 slopes. There are a number of variations of these sections to fit specific conditions.

Each roadway consists of an asphaltic concrete pavement 2½ inches thick and 24 feet wide on a stabilized sand-shell base which is 26 feet wide and 8 inches thick. Below the base, a sand fill averaging 5 feet in depth distributes roadway loads over the soft subgrade.

Clearing the jungle-like growth of cypress and other trees from the swampy ground looked like a difficult job. But the contractor found the job relatively easy, since most of the roots were close to the surface. He also discovered that while large tractors like the Caterpillar D8's mired down very easily in the soft swampland, the smaller D4 and D6 machines stayed up much better. Consequently, D4 and D6 tractor-dozers did practically all the clearing, dozing trees and brush into piles on the right-of-way for burning.

Working from timber mats, a Lima 405 dragline started the excavation by digging roadside ditches. This resulted in a lowering of the ground water level and provided for the run-off of surface water. Two big draglines, also on mats, followed to excavate a trench the full width of the roadway down through half or more of the peat soil. One of these machines was a Marion 362 equipped with 85 feet of boom and using a Hendrix lightweight bucket. The long reach of this machine enabled it to work near the center of the right-of-way and cast the material to a spoil bank at the edge.

The other dragline, a Bucyrus-Erie 38-B, excavated the trench for the outer half of the roadway, casting the peat on the same spoil bank. This machine also used a Hendrix 2-yard dragline bucket. After the roadway had been completed, tractor-dozers knocked down the spoil banks, and the material was spread over the adjacent land. More than 500,000 cubic yards of this roadway excavation was included in the project.

Long haul for sand

The roadway trench was normally dug to a depth of between 5 and 6 feet, so that about half the peat was left in place over the soft clay subsoil. The remaining peat was compacted to a relatively high degree of stability as the trench was backfilled with sand, and a surcharge of sand was carried while the fill was placed. It was found that if too heavy a fill were placed, the subsoil would fail and actually boil up at the sides of the road.

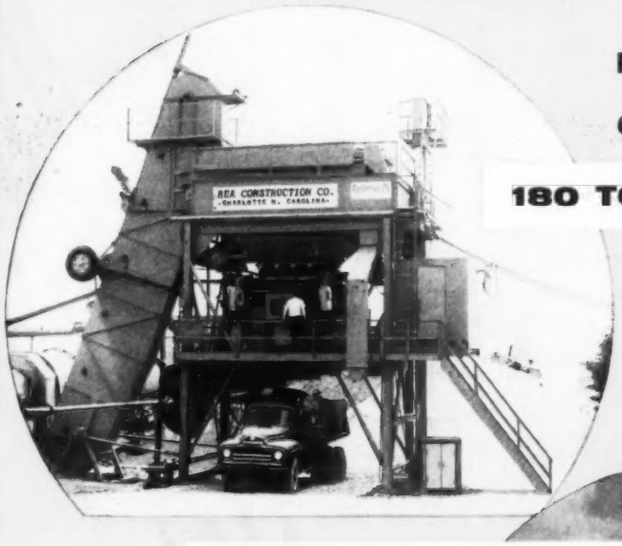
Practically the only available source

(*Continued on next page*)

Now you can BID LOW PROFITABLY

on any size bituminous mixing job

with one of these high capacity, low maintenance Cedarapids Plants



180 TONS PER HOUR

Here's the new Model G60 batch-type plant that helps outfits like Rea Construction Co., of Charlotte, North Carolina, go after the big-money contracts. Rea's all-automatic G60 is producing at a steady 180 ton per hour clip...taking up to 7500-lb. batches, the G60 discharges a 3-ton batch every minute to meet the most exacting specifications!

120 TONS PER HOUR

The new Model G40 batch-type plant is just like the big G60 except for size and capacity. It has the same advantages of accurate batching and uniform output, the same easy portability and quick set-up, the same quality-construction throughout the plant. It's designed for jobs requiring around 120 tons per hour average production, and takes up to 5000-lb. batches.

45 TONS PER HOUR

Model H15 is a brand new Cedarapids batch-type plant designed for medium sized bituminous paving jobs, where capacities from 35 to 45 tons per hour are required. The H15 is a stack-up, tower type plant, extremely easy to erect, as each section is a self-contained unit. Manually operated, or equipped with optional electric timing and locking device, this plant is a proved money-maker rated to handle up to 2000-lb. batches.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

A Bucyrus-Erie 38-B crane with a Vulcan 3,000-pound drop hammer prepares to drive untreated pine piling for another culvert. The footing excavation is kept dry by the Rex 4-inch pump in the foreground.

(*Continued from preceding page*)

of sand within hauling distance was the shallow deposit in the spillway of the Bonnet Carre Floodway. On the few occasions when the floodway had been opened to divert part of the flood flows of the Mississippi River into Lake Pontchartrain, shallow deposits of sand built up in the spillway area. These deposits usually cover rather wide areas and range from less than 1 foot to 5 or 6 feet in depth. Most of the material used on this job had to be reclaimed from deposits less than 5 feet deep.

Since the spillway area from which the sand was obtained is controlled by the U. S. Army Corps of Engineers, operations had to be carried out under Corps direction. After the thin sod covering the sand was stripped by dozers, the sand was loaded into standard dump trucks by three draglines—two Koehring 304's and a Lima 604. At times, as many as 130 trucks —most of them Ford tandem-axle units with 8-yard dump boxes—were hauling the material simultaneously.

The haul distance from the borrow pit to the closest part of the job was approximately 15 miles, and to the farthest point it was at least 7 miles more. This made the average round trip for each load of material at least 37 miles. Most of this haul was over U. S. 61, the Airline Highway from New Orleans to Baton Rouge.

All the trucks had to make a left turn off the highway onto a local street leading to the job. Because of the unusually large number of trucks making this turn on the busy highway, the contractor secured police approval to install an automatic traffic signal at the intersection. The signal, with a separate left-turn interval to stop oncoming traffic, gave the trucks a chance to turn.

This contract included almost 650,000 cubic yards of this sand, so that even though the fleet of trucks hauled as much as 6,000 cubic yards some days, the work still extended over a long period of time.

Backfill operations were timed to closely follow excavation of the roadway trench. At first the trucks tried end-dumping directly into the trench, but the sand proved too soft to support them, and the operating method had to be modified. Five dozers—two Caterpillar D8's a D7, a D6, and an Allis Chalmers HD-19—were placed on the fill to push sand into the trench as trucks dumped to the roadway.

Backfill is surcharged

To provide additional compaction of the remaining peat and the underlying clay, surcharge was carried above the normal level of the subgrade. This surcharge was sloped from 0 at the lead edge of the fill to a maximum of 5 or 6 feet deep about 200 feet back. Dozers moved this surcharge ahead continuously, pushing it forward as the fill advanced. As the soft underlying muck had a tendency to squeeze out ahead of the fill, more solid material was consolidated to support the roadway loads.

No special compaction was required, since the top 6 inches of the sand fill was compacted well enough by the tractors and trucks to meet the required 95 per cent Proctor density. The sand was subgraded to within ½-inch tolerance by Caterpillar No. 12 motor graders in preparation for the base course.

Bridges or culverts were required for each crossing of the highway by cross-roads or by the many canals or drainage ditches in the area. Major bridges were founded on 18-inch-square precast-concrete piles cast on site. Piles up to 80 feet in length were driven to bearing in deep sand layers to support these reinforced-concrete structures.

Smaller structures such as box culverts were founded on untreated pine

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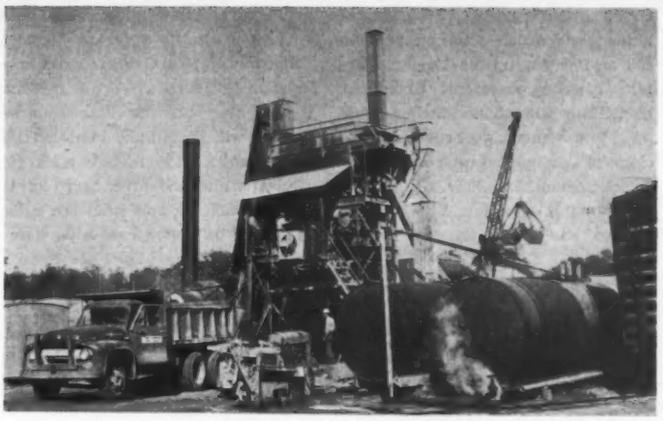
timber piles 20 to 30 feet long, which found bearing in shallow sand layers near the surface. If the long concrete piles stopped in these first sand layers, they were jetted through and brought to bearing in better conditions further down. Driving the concrete piles was sublet to Leston Watson, Dallas, Texas. Wood piles were driven by James' crews, which used a Bucyrus-Erie 38-B crane and a Vulcan 3,000-pound drop hammer.

In addition to the bridges and box culverts, the contractor installed 6,500 linear feet of corrugated metal and reinforced - concrete pipes ranging from 24 to 36 inches in diameter.

Build flexible pavement

When a section of the sand subgrade had been finished, construction started on the sand-shell base course. Three types of material were hauled in separately, windrowed, and mixed on the road. The first windrow of clamshell contained about half of the required volume of material, and about equal amounts of sand and reef shell were added to complete the lift. As these materials were bladed together and mixed by a Flynn stabilizer, the necessary water was added to obtain the optimum moisture content. About an 8-inch lift of these loose materials was required to form a 4-inch compacted course.

The first lift, thoroughly mixed and properly moistened, was compacted by Blaw-Knox and LaPlant-Choate sheepsfoot rollers pulled by Caterpillar D6 tractors. These achieved a minimum density of 98 per cent as measured by the AASHO T99 method modified. The second lift, placed identically, was bladed accurately to grade by Caterpillar No. 12 motor graders and finished by Tampo pneumatic rollers pulled by Ford tractors.



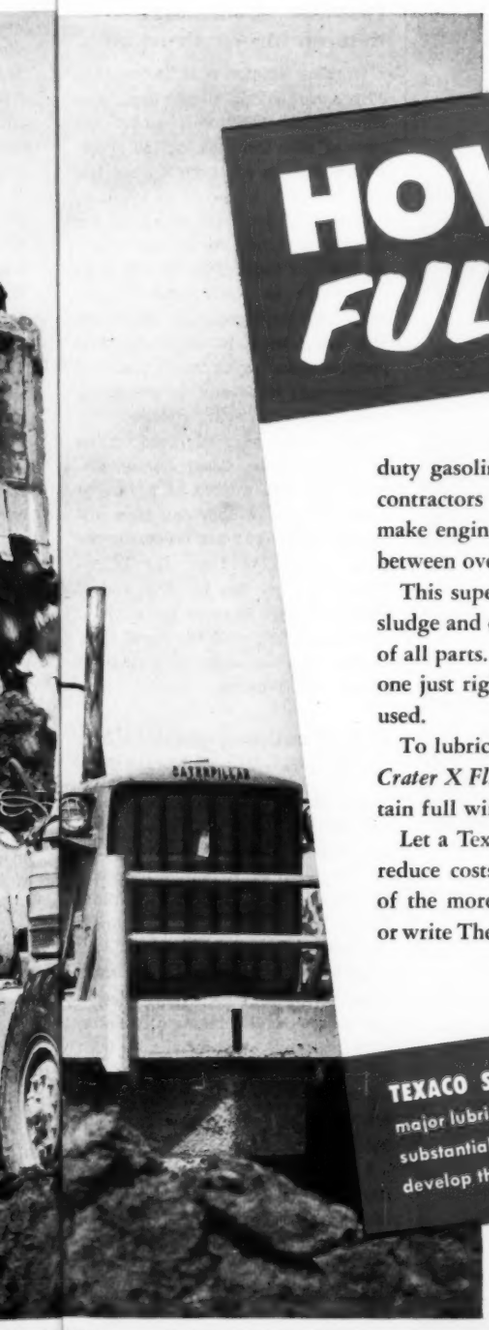
Hot-mix is produced in a Madsen all-electric-powered plant in the T. L. James & Co. main yard, near a residential area. Though the plant is in full operation, only a trace of smoke and steam comes out of the stacks.

The base was treated with bituminous primer at the rate of 0.25 gallon per square yard from 3 to 10 days in advance of bituminous surfacing. Just before surfacing, the base was swept by a Grace traction-powered broom towed by a Ford tractor and given a tack shot of RC-1 cutback asphalt at the rate of 0.04 gallon per square yard. A similar tack coat was applied between the two courses of asphalt surfacing.

Bituminous mixes for the binder and surface courses were similar except for the maximum size of coarse aggregate. Crushed gravel aggregate for the binder was graded from 1¼ inches down, while the surface course had a maximum of ¾-inch material. Both mixes contained sand and mineral filler (oyster shell dust), and about 5.5 per cent of 60 to 70 penetration asphalt cement.

Hot mixes were prepared in a Madsen plant at James' main yard near Kenner, La., about five miles from the job. The 4,000-pound batch-type pugmill regularly turned out 120 tons of high-quality mix hourly. Electrically operated and gas fired, the plant produced remarkably little smoke and dust. This was particularly important because it was located close to residential property. At the plant, a Northwest 25 crane with a 1-yard clamshell bucket unloaded aggregates from cars and handled materials from the stockpiles to the feeder bin. A bucket elevator took the cold materials to the dryer, and a hot elevator lifted them to the gradation unit above the bins at the top of the plant. Asphaltic cement was heated by steam generated in a gas-fired boiler. Bulk dust was handled directly from cars to plant bins by a special elevator.

As fast as it was delivered, the mix was laid by two Barber-Greene finishers operating almost side by side to assure a hot center joint. This joint was barely discernable after a Huber 10 to 12-ton three-wheel and a Galion 8 to 10-ton tandem finished rolling for both finishers. The Barber-



HOW TO GET FULL POWER

FULL POWER from diesel and heavy duty gasoline engines is possible only with effective lubrication. So contractors everywhere use *Texaco Ursa Oil*—especially refined to make engines deliver *more power* with *less fuel* over *longer periods* between overhauls.

This superior oil gives you even more. It keeps engines free from sludge and carbon deposits... it minimizes wear and prolongs the life of all parts. There is a complete line of *Texaco Ursa Oils*. You can get one just right for every engine whatever the size, type, speed or fuel used.

To lubricate wire rope or open gears, use *Texaco Crater* or *Texaco Crater X Fluid*. They provide quiet, smoother gear operation... maintain full wire rope strength.

Let a Texaco Lubrication Engineer help you step up efficiency and reduce costs in every phase of your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO SIMPLIFIED LUBRICATION PLAN. You can handle all major lubrication with not more than six Texaco Lubricants—and save substantially in time and money. Let a Texaco Lubrication Engineer develop the Plan best suited to your particular demands.

Texaco Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Greenes placed nearly 12,000 tons of binder and 8,000 tons of wearing course, to make up the 2½-inch surface of the pavement. Shoulders, bladed to within about 4 inches of the finished pavement, were surfaced with clamshell compacted with oscillating-wheel pneumatic rollers.

Approximate total quantities of the various pay items on the project included:

Clearing and grubbing	180	acres
Roadway excavation	521,000	cu. yd.
Sand borrow	647,000	cu. yd.
8-inch base course	172,500	sq. yd.
Bituminous binder	12,000	tons
Bituminous wearing course	8,000	tons
Culverts (c.m. & r.c.p.)	6,500	linear ft.

Plans are now under way for an extension of the Veterans Memorial Highway to New Orleans Expressway system to the east. Work is presently under way on the long causeway which will span Lake Pontchartrain to provide a better route between New Orleans and the area north of the lake. Traffic to and from the causeway will be routed over a portion of the highway built by T. L. James.

Future plans call for extending the highway westward into an area which is still undeveloped. This extension would circle Moisant Airport and meet the Airline Highway some 20 miles west of New Orleans.

Personnel

Project manager for T. L. James & Co., Inc., during most of the project was L. H. Hadnot. He was succeeded by A. W. McWhorter as the work was nearing completion. Engineer for the contractor was R. D. Morgan. These men were assisted on the job by Henry Spohrer, superintendent of bridges and culverts, and H. H. Hanks, paving superintendent. Kent Saxon is superintendent of the paving plant. Palmer & Baker, Inc., the consulting engineering firm, was represented on the job by E. W. Marley and G. H. Manning, resident engineers. J. J. Holtgreve is chairman of the Jefferson Parish Police Jury, the governing body of the parish. THE END

A cheering note—leisure time for recreation for the average employed American has nearly doubled since 1900.

By using two 9-foot-radius rods attached to the front and rear of the machine, Green Construction Co., Pampa, Texas, uses the Ditch-Witch trencher to cut perfect circular trenches on 18-foot diameters. This operation drastically cut labor costs and construction time on the project.

Trencher slashes cost, time on bin construction

Working 66 per cent faster at a 96 per cent saving in cost over hand labor, a Ditch-Witch trencher cut circular base trenches for 150 grain-storage bins in southern Kansas last year.

Contract specifications called for circular trenches on 18-foot diameters, 6 to 8 inches wide and 12 to 20 inches deep, in which metal rings, or bases, for the bins could be buried. The bases were to serve the dual purpose of anchoring empty bins during strong winds and of protecting grain from burrowing rodents.

Hand labor originally used on the job by Green Construction Co., Pampa, Texas, worked at a rate of five circles per 8-hour day at a cost of more than $23 per circle. In the same amount of time, the Ditch-Witch trencher dug trenches for 60 circles for only 96 cents per circle.

The machine paid for itself after cutting approximately 54 of the required 150 trenches.

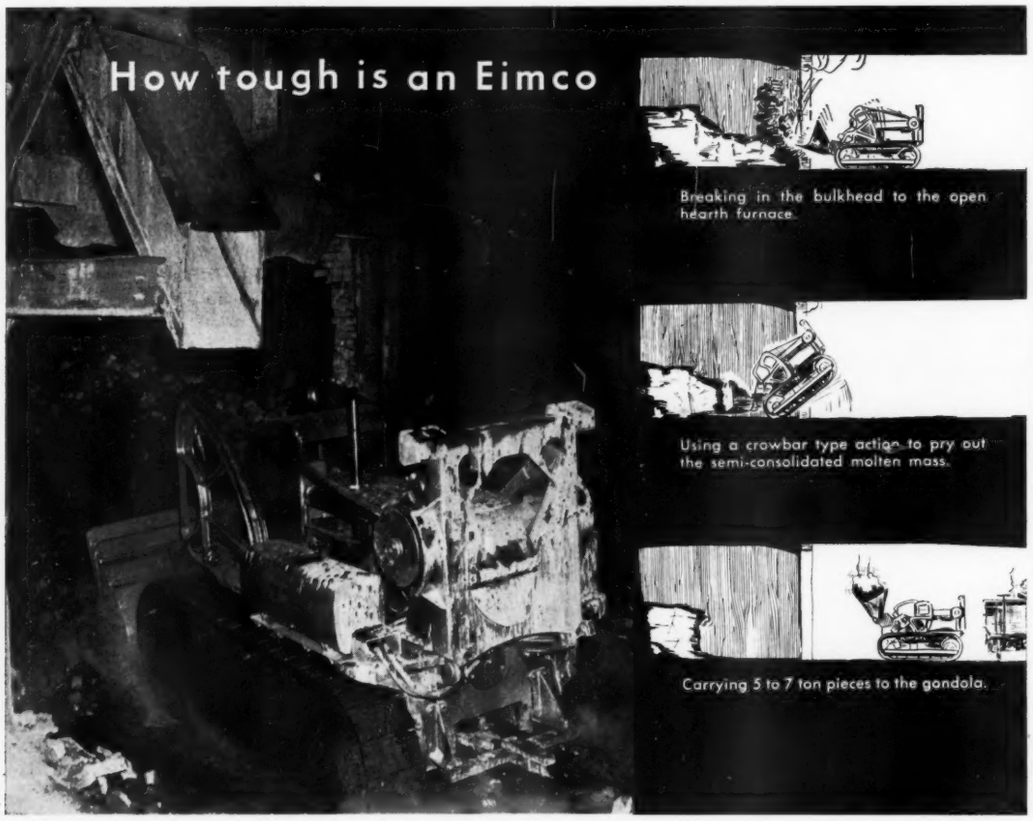
Use of building plastics treated in new book

The proceedings of a conference on the use of plastics in building, conducted last year in Washington, D. C., by the Building Research Institute, have been reprinted in a well illustrated book, "Plastics in Building", published by the institute.

Separate articles based on talks given at the 1954 conference discuss the properties of building plastics, their various applications — both structural and decorative—in building, standards and codes as they apply to these materials, and future uses of plastics.

Findings of the conference are summarized, and a list of those attending the conference is included. Many photographs, drawings, charts, and tables illustrate the discussions.

"Plastics in Building", publication 337 of the Institute, is priced at $5, and may be ordered from the Building Research Institute, Division of Engineering and Industrial Research, National Academy of Sciences, 2101 Constitution Ave., Washington 25, D. C.


How tough is an Eimco
Breaking in the bulkhead to the open hearth furnace.
Using a crowbar type action to pry out the semi-consolidated molten mass.
Carrying 5 to 7 ton pieces to the gondola.

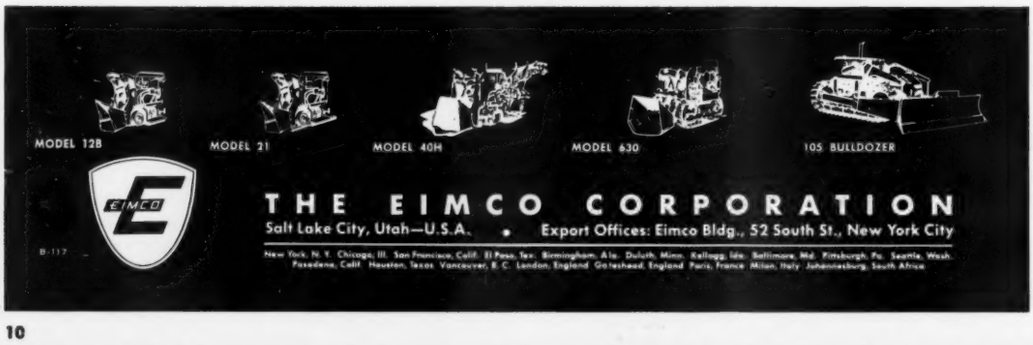
"That's the only loading machine that can stand up on this job," says an open hearth superintendent watching his Eimco 105 Tractor Excavator digging in a slag pocket.

Dozens of Eimcos are now working in steel mills digging out the molten slag in furnace repair work on the slag pockets in open hearth furnaces.

Eimcos have been selected where all other types of loading machines have been tried and found unsatisfactory for the service required from a maintenance or operating standpoint.

Eimco Tractors with Eimco Excavating attachments have been designed for this extra hard service on any kind of job. Each part is selected for maximum strength regardless of total weight.

All 37,000 pounds of the Eimco is functional. When you need a loading machine, see the Eimco before you buy. This is truly the easiest to operate, most maneuverable and fastest loading machine on the market. Write for complete information.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CONVENTION CALENDAR

July 17-20 National Association of County Officials

Meeting, John Marshall Hotel, Richmond, Va. Keith L. Seegmiller, executive secretary, NACO, 1616 Eye St., Washington, D. C.

August 1-5 National Shade Tree Conference

Conference, Mar Monte Hotel, Santa Barbara, Calif. L. C. Chadwick, secretary-treasurer, NSTC, Department of Horticulture, Ohio State University, Columbus, Ohio.

August 12-14 Seabee Veterans of America

National Convention, Hayes Hotel, Jackson, Mich. Norman P. Sercombe, convention chairman, SVA, Hotel Hayes.

September 8-10 Western Association of State Highway Officials

Thirty-fourth Annual Conference, Jackson Lake Lodge, Moran, Wyo. R. G. Stapp, chairman of program committee, WASHO, Wyoming Highway Department, P. O. Box 931, Cheyenne, Wyo.

October 2-5 American Public Works Association

Public Works Congress and Equipment Show, Hotel Schroeder, Milwaukee, Wis. D. F. Herrick, executive director, APWA, 1313 E. 60th St., Chicago, Ill.

October 2-8 International Road Federation

Second World Meeting, Food and Agricultural Organization Buildings, Rome, Italy. IRF, 1023 Washington Bldg., Washington 5, D. C.

October 4-7 Ohio Short Course on Roadside Development

Short Course of Instruction, Department of State Buildings, Columbus, Ohio. Wilbur J. Garmhausen, chief landscape architect, Ohio Department of Highways, 450 E. Town St., Columbus, Ohio.

October 10-12 American Society of Lubrication Engineers and American Society of Mechanical Engineers

Second Annual Lubrication Conference, Hotel Antlers, Indianapolis, Ind. William P. Youngelaus, administrative secretary, ASLE, 84 E. Randolph St., Chicago 1, Ill.

HRB bulletins on land acquisition, soil action

Two bulletins published by the Highway Research Board treat, separately, the subjects of land acquisition and soil freezing. Both contain reports given at the HRB's annual meeting last January.

Bulletin 101, "Trends in Soil Acquisition", contains three papers dealing with land-use controls as they affect highway programs, and a fourth paper on controlling the use of access in roadside development. The annual report of the HRB Committee on Land Acquisition and Control of Highway Access and Adjacent Areas is also included.

"Soil Freezing", Bulletin 100, contains papers dealing with freezing and thawing tests on mixtures of soil and calcium chloride, frost determination by electrical resistance, and frost action on small footings.

"Trends in Soil Acquisition" is priced at $1.50, and "Soil Freezing", at 60 cents. Both may be ordered from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

A Windsor saw powered by a Kohler 26-hp engine uses a Consolidated carbide bonded diamond blade to cut joints on a new concrete apron at New York City's Idlewild Airport. The new longer-life blade saved the contractor approximately 60 per cent in blade costs. ►

New blade slashes costs of sawing apron joints

A saving of 60 per cent in blade costs was reported by the contractor on the first job in which tungsten-carbide diamond blades were used to cut green concrete.

Master Waterproofers, Inc., Long Island City, N. Y., subcontractors on the joint-sawing and sealing operation for a new concrete apron at Idlewild International Airport in New York City, used the Consolidated Diamond Tool Corp.'s carbide bonded diamond blade to cut 24-hour-old concrete. Traprock aggregate in the concrete had quickly worn out other blades, but the Consolidated model held up well during the cutting and better than tripled the footage obtained with other models.

Where other blades lost side clearance when half used, thus requiring recutting of 50 per cent of the footage, the Consolidated blade met the requirements for width and eliminated the necessity for second cuts.

Specifications institute elects J. A. McGinniss

Joseph A. McGinniss of New York, N. Y., recently was elected president of the Construction Specifications Institute at the association's eighth annual meeting in Washington, D. C. A past president and co-founder of the New York Chapter of the institute, Mr. McGinniss heads his own specification-writing firm in New York.

MAKE **NEW PROFITS** WITH A

CONVEYCO COMPLETELY PORTABLE

BATCH PLANT

Made to be Moved...

Anywhere a truck can take it with no over-width permit needed

Modern contractors and concrete producers know the importance of bringing the source of concrete close to the job. Conveyco has used its 35 years' experience in batch plant engineering to design a portable plant with every detail planned to produce components in easy-to-transport sizes . . . in a ready-to-run condition. It takes just one work day to erect a plant—and dismantling is equally as fast with a minimum of labor. All components travel by truck or trailer *without an over-width permit.* The Recirculating Silo with integral bucket elevator and operating mechanisms travels on its own pneumatic wheels as a semi-trailer. You only find this matchless portability and operating efficiency in Conveyco Batch Plants.

Built for Capacity as well as Portability, Conveyco "portables" feature either belt feed, bucket elevator, or crane-operated clam shell loading of aggregates.

No Over-width Highway Permit Needed for this Plant

The 1½ and 2½ yard completely Portable Conveyco Batch Plants with capacity of 95 tons (135 tons with surcharge section), are designed specifically to move with the job—anywhere a truck can take them—and set up or take down in one work day. All components when loaded on 42" truck beds or semi's will measure no more than 8' x 9'6", giving adequate height clearance and within width requirements of most states. Plant is fully automatic or can operate manually. Recirculating Bulk Cement Silo, 10' wide, is equipped with dead axle and pneumatic tires to travel as a semi-trailer. Aggregate Loading Bucket Elevator travels assembled on trailer ready to set in place. Rescreen Unit is mounted on bin. Does not require a separate structure.

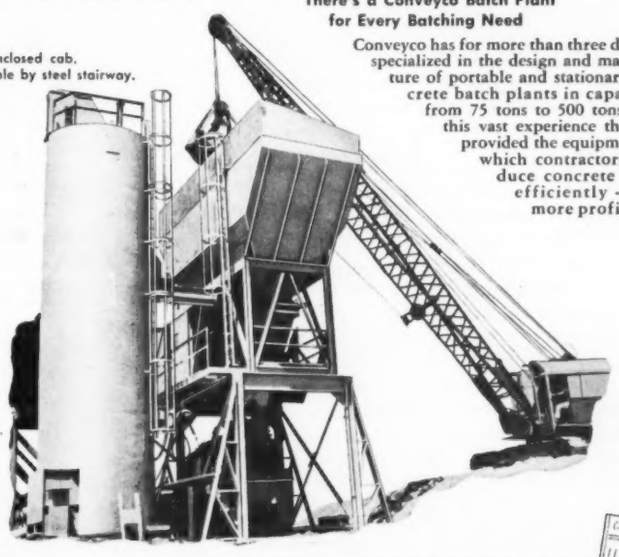
Fully enclosed cab. Accessible by steel stairway.

There's a Conveyco Batch Plant for Every Batching Need

Conveyco has for more than three decades specialized in the design and manufacture of portable and stationary concrete batch plants in capacities from 75 tons to 500 tons. It is this vast experience that has provided the equipment by which contractors produce concrete more efficiently — and more profitably.

The Conveyco 2½ yard Portable Batch Plant

(requires a 9' over-width permit) gives you needed capacity with a 4 compartment aggregate bin 9'0" 10'6" x 28'0" (115 tons or 165 tons with surcharge section). The operator's section is transported without changing any parts from their operating positions; all controls are connected. Plant can be operated fully automatic or manually. A single switchboard control panel with flexible wire leads can be connected to electric motors in one hour. Belt conveyor bucket elevator or crane-operated clam-shell can be used for aggregate loading. Recirculating Silo is 10' in diameter and travels on its own pneumatic wheels as a semi-trailer. Rescreen Unit can be added without additional structure.



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Please send free Catalogs describing Conveyco batch plants and auxiliary equipment.

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Seeded slopes grow cover before turnpike opens

As soon as grading crews finished work, this rig began the job of covering the exposed slopes with chopped straw and emulsified asphalt. Handling three bales of straw every three minutes, the machine blew the mixture over the slopes.

The variety of grasses and clover lining the route of the 88-mile-long West Virginia Turnpike from Charleston to Princeton may seem to be natural growth taking hold in the earth again, but nature got a big helping hand from Maurice Mendel, supervisor of roadside development for the turnpike commission, and his crews. As soon as highway crews moved out of one area, these men moved in to seed dynamited sites, almost vertical banks, and rocky crevices along the highway.

Mendel's job was a big one. Rocky slopes 200 feet high border the road. One embankment, built at a cost of $1,400,000 and requiring 1,500,000 tons of material, had to be seeded. Some slopes, going as much as 250 feet below original ground surface, were potentially dangerous as well as ugly. Rain and wind eroding these slopes could bring dirt down onto the highway, making maintenance difficult and creating driving hazards. Unless the earth were held in place by some kind of cover, landslides could have developed.

Work proves inexpensive

Landscaping, originally estimated to cost $750,000, was actually done for less than one-third this price—$225,000. Highway crews were still putting down the 14 inches of crushed rock base and the 1-inch sand cushion on the two-lane highway when Mendel's crews began their work.

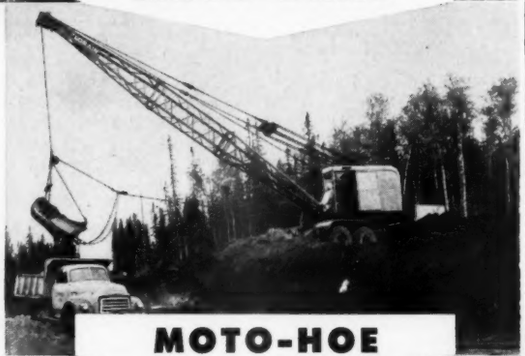
Starting their job as soon as an area was vacated, the roadside-de-

Maurice Mendel, who supervised the roadside job for the West Virginia Turnpike Commission, examines the first growth of cover along the right-of-way.

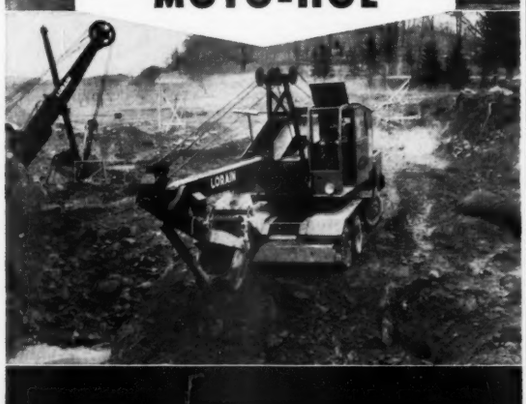
LOOK HOW THEY'RE DIGGING ON RUBBER TODAY!

MOTO-SHOVEL

MOTO-DRAG



MOTO-HOE



Rubber-tire excavators have grown up! Today, Lorain Moto-Shovels, Moto-Drags and Moto-Hoes are full-size digging machines that enable you to do real, man-size, big production jobs. The same mobile, high-speed rubber-tire advantages that have paid off for years on lifting crane uses can now make the dirt fly on excavation jobs.

Lorain rubber-tire excavators are not light-weight machines designed for occasional or secondary digging jobs. They are "he-man" machines with work capacity to tackle any job. Booms are the same sturdy design and construction as on crawler machines; dipper capacities, through the 1-yard class, enable you to put rubber to work on the majority of excavating contracts. Most important, Lorain Carriers are provided with multiple turntable mounting positions which enable you to move the turntable to a rear position to provide proper clearances for efficient digging over the rear of the machine. Multiple tires, soft-ground flotation and high-tractive effort enable these machines to leave the roadways and move right in where digging jobs are to be found.

Whether it be a shovel, dragline or hoe application, your local Thew-Lorain Distributor can show you the extra-profit opportunities you enjoy when you "dig on rubber" with a Lorain.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

Roadside-development crews start work before grading is done; grass springs up within two weeks to hold earth in place

Native grass seed, Arcadian 12-12-12 fertilizer, and water are sprayed over one of the straw-mulched slopes on the turnpike. The seed and fertilizer were held in place by the mulch even during high winds and heavy rains.

velopment men used a motor-truck rig which blew chopped straw through a pipe and covered a 75-foot swath of ground on either side of the roadway with a spray of emulsified asphalt. Handling three bales of straw every three minutes, this rig quickly spread the sticky quick-drying mulch over the earth in almost a knit fabric.

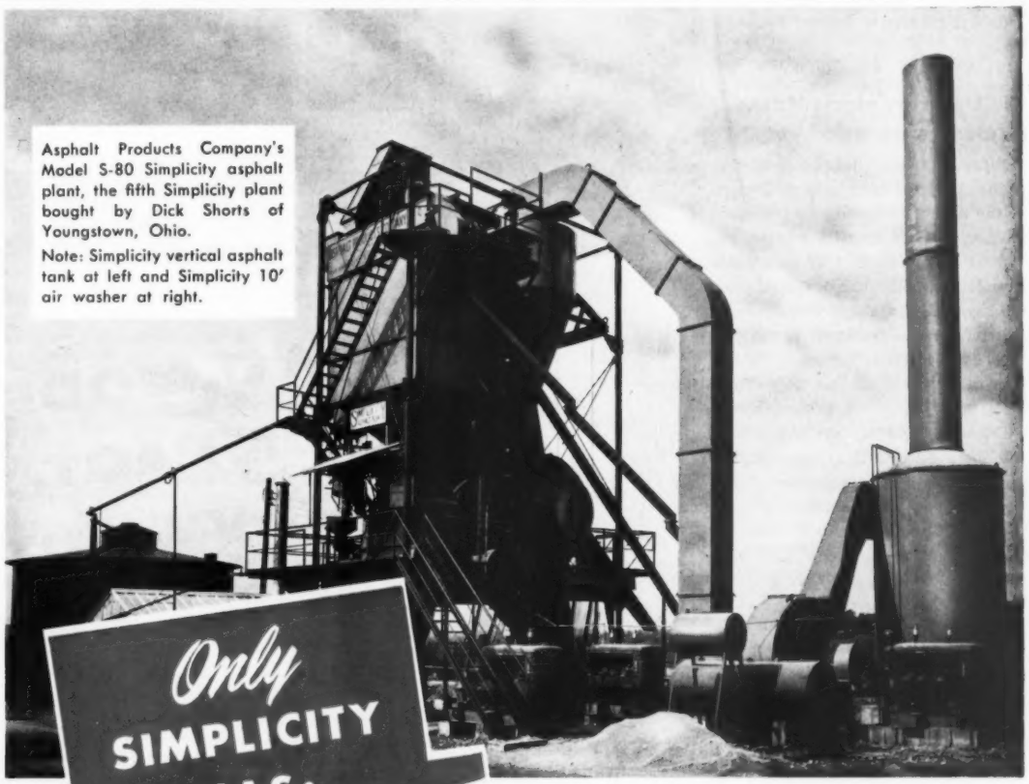
Just behind this machine was a rig which sprayed the mulched areas with a mixture of grass seed, water, and fertilizer. This mixture consisted of 125 pounds of native grass seed, 640 pounds of Arcadian 12-12-12 fertilizer, and 850 gallons of water. The fertilizer, high in nitrogen, phosphorous, and potassium—the three essentials to plant growth—had the advantage of dissolving quickly in water and leaving no residue to clog pumping equipment. The ingredients of the fertilizer, made at the South Point, Ohio, plant of Ohio Chemical & Dye Corp., are mixed to form a slurry which is reduced to uniform and soluble granules of specified low-moisture content. This is done in the company's Turba-Film evaporators, made by Rodney Hunt Machine Co., Orange, Mass., which slurries the material in a few seconds of continuous operation. The No. 5 Turba-Film units—stainless steel evaporators capable of handling 5,000 pounds of water hourly—reduce the water content of the fertilizer slurry from about 20 per cent to approximately 6 per cent.

Soil and seed were held in place by the mulch during high winds and heavy rainfall. Within two days to a week after seed had been sown, a cover of grass had sprung up to cover the raw earth and anchor the soil.

Completed and in operation since November, The West Virginia Turnpike is bordered by hills and slopes which bear no scars to show just how big a job it is was for highway crews to blast and cut their way through the mountainous terrain. But they do show evidence of a well managed and well-timed landscaping job. THE END

Supplement to new book on effects of bomb blast

A technical supplement to "The Bomb, Survival and You" (see review, C&E, Feb., 1955, pg. 16), a practical exposition of A-bomb-versus-building data, has been published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y.



Asphalt Products Company's Model S-80 Simplicity asphalt plant, the fifth Simplicity plant bought by Dick Shorts of Youngstown, Ohio.

Note: Simplicity vertical asphalt tank at left and Simplicity 10′ air washer at right.

Only SIMPLICITY HAS:

- Three compartment apron type feeder bin.
- Double shell dryer. Dependable, durable and economical in operation.
- Hot or cold mix from one double shell dryer.
- Circulation of aggregates in dryer until temperature is right. No low temperature materials put into bins.
- Renewable liner plates in dryer, breeching and dust collector.
- Furnace large enough to burn oil or gas efficiently. No unburned fuel wasted on aggregates.
- Dust collector located high above dryer—minimizing load in collection system.
- Simplicity air washer—used on every make of asphalt plant in the country.
- Double-zone mixer. Fast mixing, less wear and power.
- Tubular columns with erection hoists. Faster—easier erection.

See a Simplicity Plant in operation — talk to the Simplicity owners and operators.

THE SIMPLICITY SYSTEM
FROM BUILDER TO BUYER
BETWEEN MEN WHO KNOW

There's a
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On request, we'll be glad to send you the name and location of a nearby installation.

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NAMES IN THE NEWS

Elected to head the Metropolitan Section of American Society of Civil Engineers is Richard Hazen.

ASCE section elects Hazen, names engineer of year

Richard Hazen has been elected president of the Metropolitan Section of the American Society of Civil Engineers, a 3,600-member section including New York City, northern New Jersey, Long Island, Westchester County, and Rockland County.

A former vice president of the section, Mr. Hazen is a partner in the firm of Hazen & Sawyer, New York, N. Y.

Others elected to office in the section include Roger H. Gilman, deputy director of port development, The Port of New York Authority, vice president; and Malcolm Pirnie, Jr., Gordon Wallace, and Eugene D. Jones, directors. William J. Shea was re-elected treasurer. Arthur J. Fox was elected secretary.

At the same time, the section also announced that Shortridge Hardesty has been named to be the metropolitan area civil engineer of the year for his direction of the design of the New York Central Railroad vertical-lift bridge over the Harlem River in New York City.

Pennsylvania appoints two new engineers

Highway construction and maintenance in District 8 of the Pennsylvania Department of Highways will be under the supervision of Theodore K. Rothermund, recently appointed district engineer. From his headquarters in Harrisburg, Mr. Rothermund will direct operations in Adams, Cumberland, Franklin, York, Dauphin, Juniata, Lancaster, Lebanon, and Perry counties. He succeeds A. J. Bedard in the post.

The new principal equipment engineer of the Pennsylvania Department of Highways is Alfred A. Schneebeli. He succeeds Harvey Gehr.

A civil engineering graduate of the University of Alabama, Mr. Schneebeli was a resident engineer for the Georgia State Highway Department, in charge of construction in three counties.

Donald V. Lowe heads port authority in N. Y.

Donald V. Lowe, appointed a commissioner of the Port of New York Authority in 1945 and a vice chairman in 1953, has been elected chairman of the bi-state agency. He succeeds Howard S. Cullman, who has served as chairman of the authority for the past ten years.

The new chairman of the Port of New York Authority, Donald V. Lowe.

Mr. Lowe, president of the Lowe Paper Co., Ridgefield, N. J., a director and former president of the Bergen County Chamber of Commerce, is active in several manufacturing associations and serves as a director of a number of organizations. He is a chemical engineering graduate of Columbia University, and has attended Rutgers University and the University in Charlottenburg, Germany.

Mr. Cullman, who has been with the authority for 28 years, has been made honorary chairman. Bayard F. Pope is the new vice chairman of the

NEW FROM CATERPILLAR!

TWO MODERN, COMPACT, HEAVY-DUTY DIESEL ENGINES

THE NEW D342

THE NEW D339

190 HP	**INTERMITTENT OUTPUT** Maximum recommended for loads of short duration (1 hour or less) with equal periods at idle or low load.	126 HP
171 HP	**RATED OUTPUT** Maximum recommended for loads of moderate duration (12 hours or less) with equal periods at idle or low load.	112 HP
152 HP	**CONTINUOUS OUTPUT** Maximum recommended for loads of unlimited duration.	100 HP

All at 1200 r.p.m. with full equipment

This is the same trouble-free engine which powers Caterpillar's mighty D8 Tractor and No. 583 Pipelayer. Coming soon: the new D342 Electric Set!

Balancers—standard equipment on the new D339—give this powerful 4-cylinder engine all the smoothness of 6-cylinder performance!

agency. He was first appointed a commissioner in 1944 and has been chairman of the committee on finance.

The Moles elect officers

At their annual meeting in New York City, The Moles, an association of tunneling and heavy construction men, elected A. Holmes Crimmins, of Thomas Crimmins Construction Co., New York, N. Y., president of the organization. Mr. Crimmins succeeds George F. Ferris.

Others elected were: Thomas J. Walsh, Jr., Walsh Construction Co., first vice president; Richard A. Johnson, Arthur A. Johnson Corp., second vice president; Edward G. Johnson, also of the Johnson Corp., treasurer; Gilbert M. Serber, Stock Construction Co., secretary; and Frank M. Loughman of Ace Builders Supply, sergeant-at-arms.

Elected for a three-year trusteeship were: James F. Armstrong of Senior & Palmer, Edmund M. Burke of Bethlehem Steel, M. G. Kennedy of Morrison-Knudsen Co., and Leonard Van Houten of J. Rich Steers, Inc.

Mr. Crimmins has been membership chairman and a trustee of The Moles for three years. He is the treasurer of the Crimmins company.

William A. Johnson, second from left, heads the Beavers, a new organization of western builders. Officers, left to right are J. C. Maguire, secretary-treasurer; Johnson; L. E. Dixon, senior vice president; James L. Lovell, ambassador of good will, and J. P. Shirley, Jr., assistant secretary-treasurer.

New construction group elects Johnson president

Builders of heavy-construction projects in the West have formed the Beavers, an organization of men and companies involved in heavy engineering work on such jobs as bridges, dams, stadia, aqueducts, and similar projects west of the Mississippi River and in Alaska.

Elected to head the organization during its first year is William A. Johnson, chairman of the Board of American Pipe & Construction Co., Los Angeles, Calif.

Other officers include L. E. Dixon, senior vice president; George H. Atkinson, junior vice president; J. C. Maguire and J. P. Shirley Jr., secretary-treasurer and assistant secretary-treasurer, respectively; and James L. Lovell, ambassador of goodwill.

Frank R. Creedon recently joined M-C&S as an executive in the construction division.

Creedon joins M-C&S construction division

The former director of installations for the U. S. Department of Defense, Frank R. Creedon, has joined Merritt-Chapman & Scott Corp., New York, N. Y., as an executive of the company's construction division. Mr. Creedon will serve as assistant to Charles A. Richardson, vice president in charge of the marine and heavy construction department of M-C&S.

During World War II Mr. Creedon served as resident manager in charge of construction of the atomic energy plant at Oak Ridge, Tenn. The Medal for Merit, the nation's highest civilian honor, was awarded Mr. Creedon for his service.

Here are the latest advances in diesel engine design. Compared to other engines in their class, these two new CAT* Engines offer you better operation, less maintenance, higher horsepower and more compact design. Take a quick look!

CHOICE OF STARTING SYSTEMS!

AIR

For fast starts where a supply of compressed air is readily available, a sturdy vane-type air motor is offered. Also available: air compressors and storage equipment.

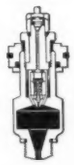
ELECTRIC

Where speed of starting is especially important. Also available: automatic start-stop controls which require no operating personnel.

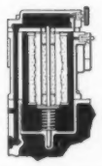
GASOLINE

For all-weather starting. This system preconditions the diesel, and supplies full lubrication before diesel is started. Also available: electric starters for the gasoline starting engine.

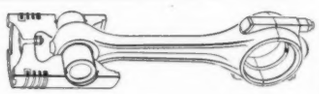
ECONOMICAL FUEL SYSTEM!



Same famous tinker-free fuel system so successful on other Caterpillar Engines. Capsule-type injection valves with single, large, foul-proof orifices, plus special precombustion chambers, permit these engines to operate—even idle—on low-cost non-premium fuels. And full-flow filtering is assured with new paper-type element that is not affected by water.



FIELD-TESTED PISTON ASSEMBLIES!



Pistons, rings and rods in these two new engines are like those used in Caterpillar's famous V-type Engines. Heat plugs, chrome-faced rings, cast-iron top ring bands give thousands of hours of operation before inspection is necessary.

MANY OTHER IMPORTANT FEATURES!

BRIEF SPECIFICATIONS

D342		D339
6	Number of cylinders	4
5¾ in. x 8 in.	Bore and stroke	5¾ in. x 8 in.
1246 cu. in.	Piston displacement	831 cu. in.
1200	Rated speed, r.p.m.	1200
425	Low idle speed, standard, r.p.m.	425

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We'd be glad to send you more information on the new D342 and D339. Just mail the coupon below.

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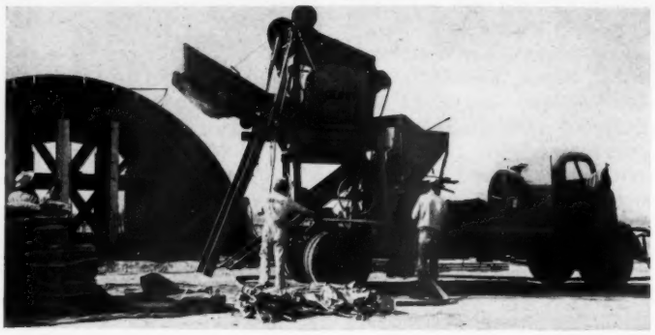
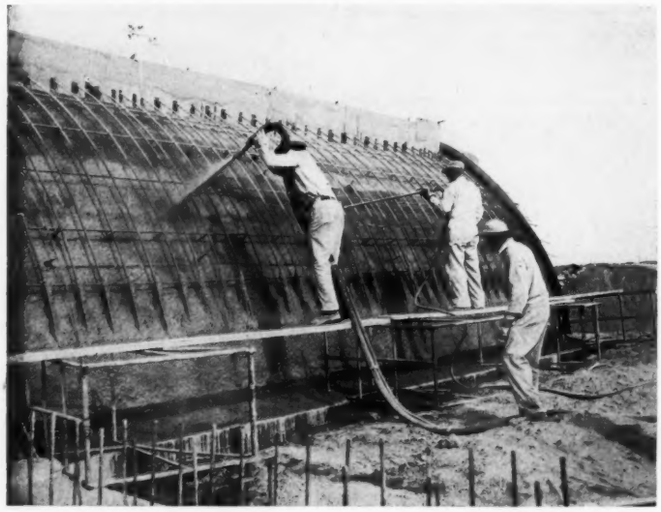
THE D342 AND D339—LATEST EXAMPLES OF CATERPILLAR LEADERSHIP IN ACTION

A truck-mounted gunite unit mixes material for crews working on one of the igloos. Shoring and bracing inside the barrel holds forms tight while gunite is placed for the dome.



Half the gunite is placed in a first pass. After completing similar work on the other side of the barrel, the crew will return to finish this wall to its required thickness. Doing the work in two passes prevents the material from sagging.



Guniting cuts c st

Barrel, finished in 18 hours, requires no outside forms; work is done in two passes to keep material from sagging

By letting one of its contractors use an unconventional method for constructing 40×26-foot storage igloos at Luke Field, Arizona, the U. S. Army Corps of Engineers saved $1,861.13 on each of five units.

When Vinson Construction Co., Phoenix, suggested that guniting would do the job better and at less cost than conventional methods, William J. Leen, chief of operations, and Col. Arthur H. Frye, district engineer for the Corps' Los Angeles office, recommended that the change be authorized. As a result, the price of igloos was cut from $17,052.67 to $15,191.54 per unit. Test cylinders of gunite showed 28-day strengths as high as 7,357 psi, and averaged well over 5,000 psi. The completed igloos were backfilled with earth about two months after the guniting job was finished.

The secret of the job's savings in time and money was the fact that no outside forms were necessary with the gunite method, and inside forms were stripped only 12 hours after guniting was finished, permitting crews to jump ahead to the next

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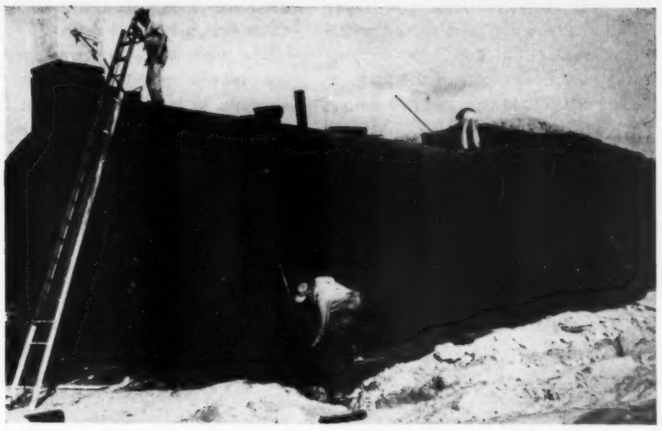
storage igloos



After the igloos have been finished, a coat of Hunt Process Black vapor seal and waterproofing compound is applied. The structure will get a second coat later.

The five structures included in the job stand completed and ready for backfilling. End walls as well as the barrels of the structures are built with gunite concrete.

unit. Pargeting—covering the completed igloo with protective plaster—was even done by the gunite method. Here too, it saved time and produced a better job than the plaster normally used for this work.

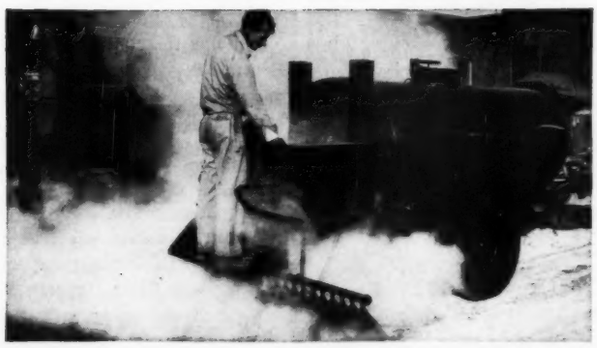
The five standard-type military storage igloos constructed are 40 × 26-foot units with tapered dome-shaped superstructures ranging from 6 to 18 inches thick. Original plans called for the units to be built with the usual reinforced concrete. The change order retained everything but the outer concrete form and the original concrete-placing method.

Barrel forms and reinforcing

Barrel forms were 4 × 8-foot ribbed panels. Faced with ⅜-inch super Harborite, a marine plywood paneling, they were framed on 2 × 4's spaced at 12 inches, shaped for the radius shown on the plans. To give tight surface joints, the panels were cut ⅛ inch short, making their actual dimensions 3 feet 11⅞ inches on the narrow side and 7 feet 11⅞ inches on the wide side. A contoured

(Concluded on next page)

STANDARD STEEL "S-J"
Maintenance Distributor



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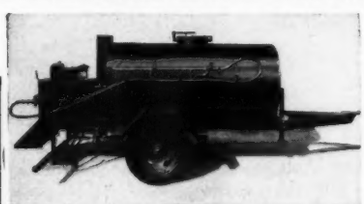

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WORKS FAST—FAR AHEAD OF THE GRAVEL GANG

Standard Steel S-J Maintenance Distributor, designed specifically for jobs where the use of bigger equipment is costly and impractical, can be moved rapidly from one location to another for patching, shoulder repair or construction of secondary roads . . . It is equipped with suck back spray bar which permits closing of the discharge valve and pulling back all surplus material in the spray bar and piping for quick cleaning . . . All piping and valves are flanged to permit easy repair or replacement . . . The draw off valve is on curb side for safety . . . and coilless self-generating burners are standard equipment as well as a Viking special asphalt pump which can be completely drained, eliminating the necessity for thawing when the unit is started cold. Write for complete details on the 1955 Model S-J.

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MAN-SIZE 36" Kolman 'a Brute for Production!'

50' x 36" KOLMAN Portable Conveyor-Screen Plant with built-in feeder and wing walls on a Peter Kiewit Sons' Co. job in Montana.

Loads Out 15-Ton Trucks In Less Than a Minute!

Here's the conveyor-screen plant that really puts it out! Contractors throughout the country are finding that the KOLMAN Model 101 comes through with top production under the severest operating conditions.

Shown above is the 50' x 36" KOLMAN plant owned by Peter Kiewit Sons' Co. It's capable of loading out these 15-ton trucks with highway base course material in less than a minute. No wonder they say it's a "brute for production!"

It carries a vibrating screen 8' x 48" without additional support, and the screen need not be removed for transportation—it just folds under out of the way.

LOOK AT THESE FEATURES

Self-cleaning tail pulley, bar type self-lagged head pulley, all anti-friction bearings, choice of greaseless or regular ball-bearing idlers, pneumatic tires, separate clutch for individual operation of vibrating screen and conveyor belt, motor-to-ground controls, hydraulic hoist with "V" type carriage tracks for low road clearance, and self-cleaning steel belt cover.

The steel dozer trap with built-in plate feeder, available as optional equipment is an integral part of the conveyor and also fully portable. Model 101 KOLMAN Portable Belt Conveyor is available in 18 to 36 inch belt widths and in lengths as desired.

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(*Continued from preceding page*)
bulkhead on each end of the barrel section developed the necessary keyway. Shoring and bracing held the form snug while guniting was done.

Since reinforcing steel was not affected by the change order, steel in the grounding system was welded according to original plan. Additional spacers between the extrados and intrados mats over the dome were placed at 4-foot longitudinal centers on the transverse steel. This held the steel true to its planned shape and required only one set of chains to do the job. The ¼-inch rods, supported on adjustable chairs, served as screeds.

Two igloos were gunited by the new method before it became apparent that an improvement could be made. On these structures, lower walls had been placed to full width part way up, but this heavy concentration caused the material to show some sag. While this was not serious enough to be detrimental, Vinson, resident engineer Gene Ankrom, and area engineer W. S. Alldredge worked out a placement system which worked perfectly.

Vinson's gunite man started placing the material at the footing, and continued until approximately two-fifths of the surface on each outside section of the barrel was finished. Guniting was done continuously, the workmen alternating between the two sides until they were filled out to the same shape. Placement on this first pass was limited to about half the ultimate thickness of the wall. It took about 10 hours to do this first day's work.

The next day, the remainder of the barrel was finish-gunited by shooting ½ to 1-inch layers of material over the entire area. This was done in continuous cycles to prevent lamination, and continued until the dome was finished. The second day's run usually took about eight hours.

End walls formed inside

Forms for end walls were 4×8-foot panels faced with ¾-inch plywood, with 2×6's for studs, interior shoring, and bracing. Both ends were formed on the inside of the igloo and gunited from the outside.

In the first pass for the rear walls, guniting was done to a depth sufficient to cover the reinforcing steel and to bond the keyway. The second application to full thickness followed immediately, and brought placing time for an average rear wall to 6 hours. The ventilator stack was formed on the inside in two sections, and gunited from the outside.

Front and wing walls were flashed to cover the reinforcing steel from the bottom to a height of about seven feet, or until the pneumatically-placed material began to sag. A construction joint then was formed as recommended by specifications of the Gunite Contractors Association. This operation took 8 hours. The remainder of the front wall then was shot to full height and depth. After material had been placed over the entire area, the surface was screeded to form the true alignment.

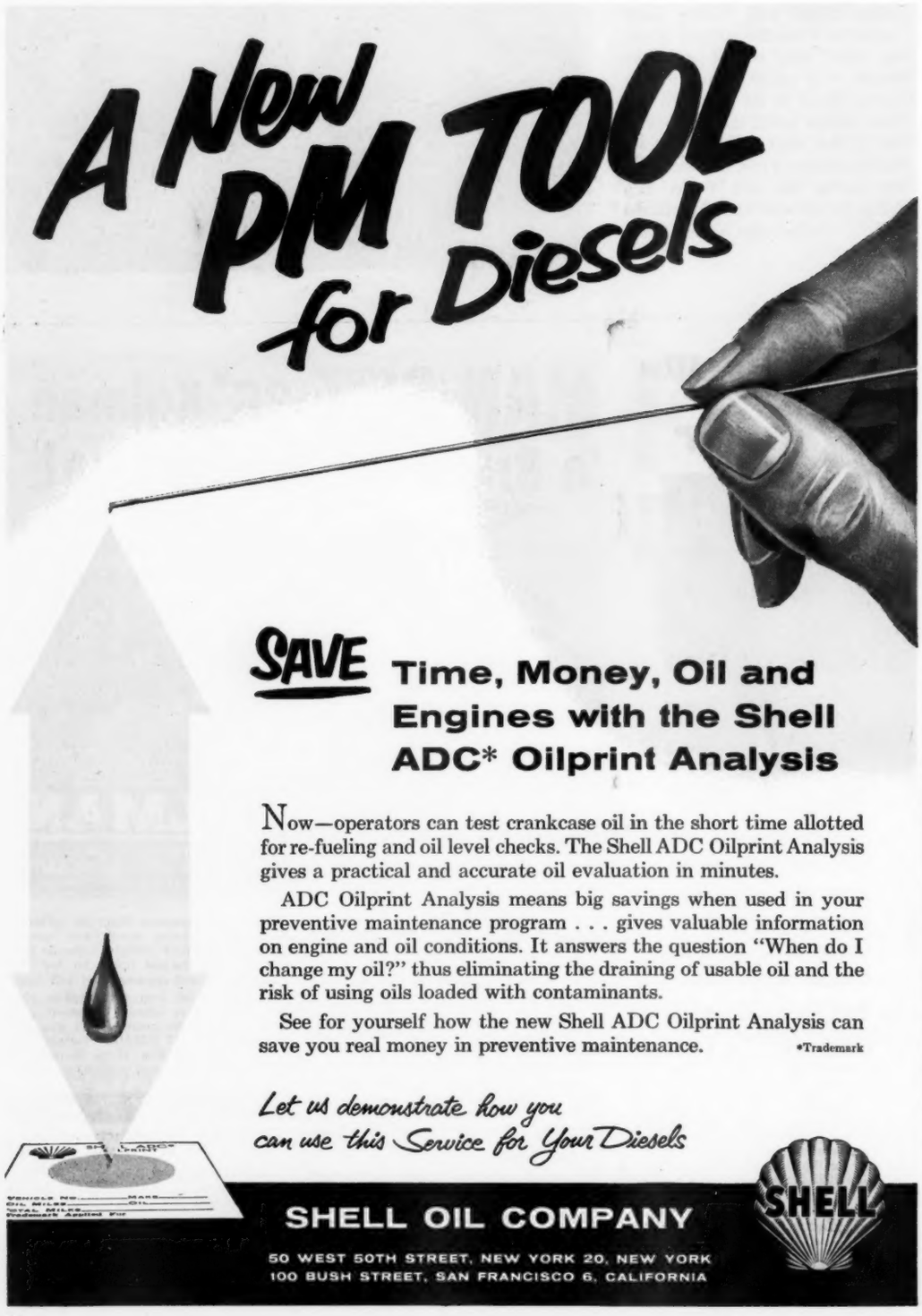
Close behind the gunite-placing operations, knife-edge hand screeds scraped loose or excess material off the igloo and formed its true shape. If low spots showed after screeding, they were immediately re-shot and re-screeded. Hand floats were used to finish the barrel, and hand floats and steel trowels were used over exposed wall sections.

Surfaces designed for earth covering and waterproofing got two coats of Hunt Process Black vapor seal and waterproofing compound. All exterior exposed surfaces were given two or more coats of Hunt Process Clear membrane curing solution. Wet burlap was used to keep exposed surfaces moist. After forms had been stripped from the barrel, canvas was hung over the open ends and fog spraying was used to keep a vapor buildup inside the structure for seven days. High compressive strengths resulted.

The mix recommended by Gunite Contractors Association, consisting by volume of 1 part cement to 4½ parts sand, graded to the same specifications, was used for the structures.

When the igloos were finished, 4×4-inch 13-gage wire mesh was placed over the area slated for pargeting. The surface was then gunited 1 inch thick and cured immediately with Hunt Process Black vapor seal and waterproofing compound. The surface has shown none of the cracking and checking usual in plaster, and the pargeting is considered to be a superior job. This whole operation for all five igloos was done in 4 days. A minor amount of checking, both vertical and horizontal, appeared on the barrel's interior walls and on the back walls at the reinforcing steel. Some shadowing of the reinforcing steel also became evident, but two coats of cement and water paint made all shadowing and checking invisible. Neither was considered detrimental in any way to the finished igloo.

Running in an east-west direction, the structures showed their worst checking on south and west exposures. But night temperatures were about 25 to 30 degrees and day temperatures in the 80 to 90-degree range where gunite was placed, and it is believed that these extremes aggravated checking. THE END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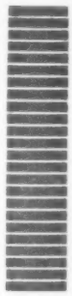

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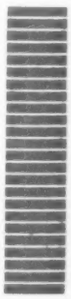

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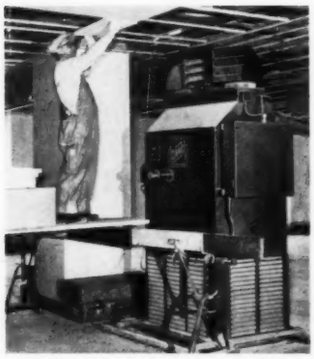
Here's how a contractor cut worker absences

The elimination of work interruptions in sub-zero weather helped cut construction time on Chicago's newest and highest skyscraper, the 41-story Prudential Life Insurance Co.'s Mid-American Office Building. Dravo Counterflo forced-air space heaters were responsible for considerable savings in time and money on the job.

George A. Fuller Co., New York, N. Y., contractor on the job, installed 16 Counterflo heaters in the building



This Dravo Counterflo forced-air space heater is one of 16 such units used by George A. Fuller Co. on the new Prudential office building in Chicago. Two heaters were used for each 40,000 square feet of floor space.

last September. Fed by portable fuel-oil tanks and served by a 220-volt power line, the units kept the inside temperature as much as 40 degrees higher than that outside. As a result, work continued without interruption during four months of Chicago's bitterly cold winter.

The heaters operated around-the-clock, seven days a week. Outside temperatures ranged to as low as 15 degrees below zero, and wind reached velocities as high as 50 mph. With only loose tarpaulins draped over the building openings, the heaters kept the inside temperature at a comfortable working point.

The contractor reports that the heaters accelerated drying and curing operations, as well as eliminating absences from work due to colds and other winter ailments.

Spencer, White & Prentis elects six to new offices

The board of directors of Spencer, White & Prentis, Inc., New York, N. Y., underpinning and foundation specialist, has elected six men to new offices in the firm.

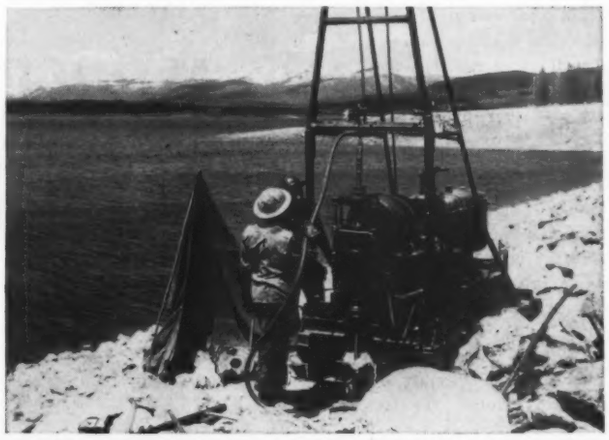
Former president of the organization, Charles B. Spencer, has become chairman of the board. He will be succeeded as president by Joseph C. Weaver. Mr. Weaver's former post of executive vice president will be assumed by Edward White.

Two vice presidents, Harry T. Immerman, former chief engineer, and Robert White, also were elected. Edmund A. Prentis III was named secretary-treasurer.

Spencer, White & Prentis of Canada, Ltd., has the same officers.

AN OWEN CLAMSHELL takes a bite of earth, marking the start of work on the $65 million Mississippi River Bridge from New Orleans to the West Bank. The cantilever structure will have a 1,575-foot center span. Dravo Corp., Pittsburgh, Pa., is constructing the four main piers. Looking on are Mayor deLesseps S. Morrison of New Orleans; Capt. Neville Levy, chairman of the Mississippi River Bridge Authority; and George S. Covert, director of the Louisiana Department of Highways.

JOY CORE DRILLS *for* FOUNDATION TESTING *or* GROUT HOLE DRILLING



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1. Extreme mobility—Steel skid mountings make moving a simple, fast operation, and cut lost time between holes to a minimum. Truck-mounted models are also available for the utmost in mobility, where terrain conditions permit the use of such mounting.
2. High drilling speed—Efficient operation, designed into Joy core drills over many years of manufacture, insures faster drilling of holes no matter what type of drilling is being one.
3. Highly accurate results—Precise control of all operations of Joy core drills makes possible the taking of accurate cores, and helps the operator to "feel" cracks and fissures when drilling grout holes.

Three models of Joy Core Drills are available—the No. 7, a lightweight, highly portable unit; the 12-B, for drilling to medium depths; and the 22-HD, a heavy-duty machine for tough requirements. Try these drills, made by the pioneer of core drill manufacturers, on your next bridge or dam job. Write for details to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

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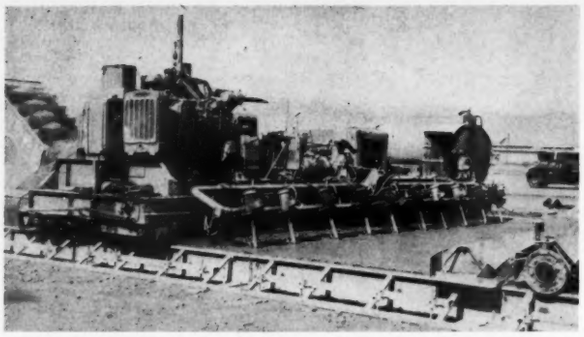


Individual vibrators on this new Gar-Bro paving vibrator are adjustable for spacing and depth.

Vibrating machine adjusts for spacing and depth

■ A new adjustable Gar-Bro paving vibrator has been designed for vibrating low-slump concrete to full depth on airport and highway paving jobs. The machine can also be used for vibrating concrete close to side forms. In this operation, vibrators are mounted only at the ends of the spreader bar.

Individual vibrators are mounted on a tubular frame and are adjustable for depth and spacing. The complete unit may be attached to a concrete spreader or it may be pulled on a special trailer. The optional trailer has a structural-steel chassis, with four single-flanged wheels, and two tongue connections for trailing behind the spreader. It is designed to carry the mounting frame, vibrators, generators, and controls.

Three-inch Viber vibrating heads operating at 10,000 rpm produce maximum compaction down to the subgrade. With power capacity requirements of 2.5 kw per vibrator, the number of vibrators used is limited only by the specification requirements and the width of the pavement.

Dual electric circuits divide the load between two generators for use when the machine works a paving width of 20 or more feet.

For further information write to Gar-Bro Mfg. Co., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 231.

High-strength bolts in structural applications

■ The use of high-strength bolts for making structural steel connections is discussed in some detail in a booklet from Russell, Burdsall, & Ward Bolt & Nut Co., Port Chester, N. Y.

The literature covers structural bolting principles, design, mechanical properties, and specifications, and compares it with the use of rivets. A section describes bolting procedure. Several examples of various types of loading are illustrated.

Advantages of bolting listed include lower over-all cost, less noise and danger, and the smaller amount of labor and equipment required. A table gives all necessary ordering information for R B & W high-strength bolts.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 239.

Flexible-shaft equipment

■ A new catalog describing the Wyco line of flexible-shaft machines including grinders, saw attachments, hole cutters, and other equipment is available on request.

Among equipment illustrated is a concrete-rubbing machine, a heavy-duty grinder mounted on a truck base, and other three-speed and variable-speed grinders. Also shown are angle heads, hand pieces, arbors, adapters, and accessories. Complete ordering information is included.

To obtain this literature write to Wyzenbeek & Staff, Inc., 232 N. California Ave., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 294.

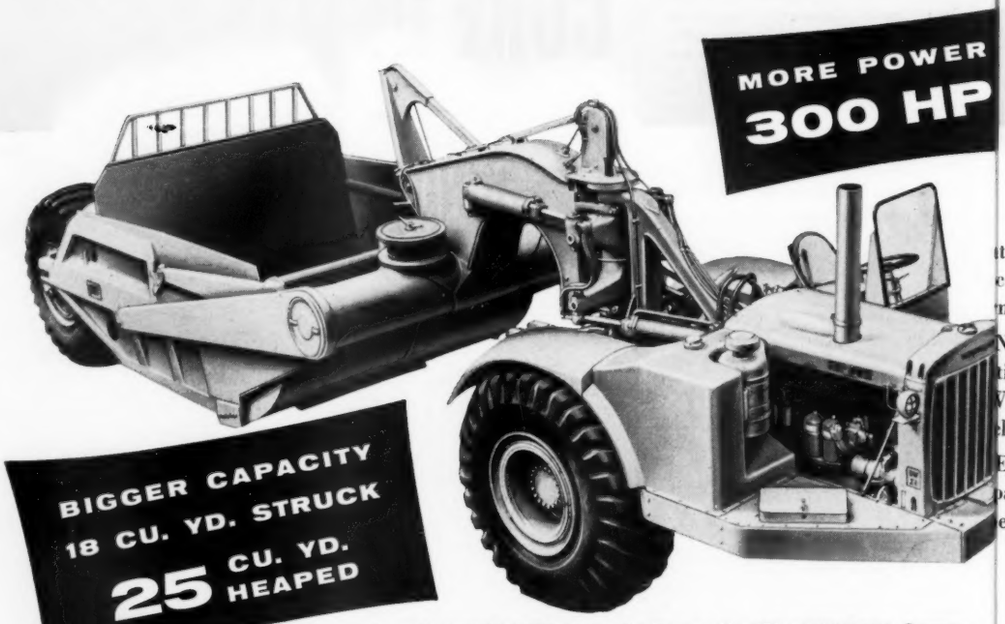
AGC Florida council elects J. Hilbert Sapp

An Orlando, Fla., contractor, J. Hilbert Sapp, has been elected president of the Florida State Council of the Associated General Contractors. President of his own firm, J. Hilbert Sapp, Inc., he succeeds Ira Koger, of Jacksonville, president of O. D. Woodcock Construction Co.

Mr. Sapp was a charter member of the Florida East Coast Chapter.

CATERPILLAR ANNOUNCES THE

New DW20-DW21 TRACTORS



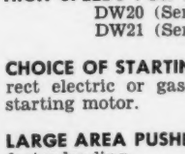
The new two-wheel CAT® DW21 Series C with new No. 470 LOWBOWL Scraper. The new four-wheel DW20 Series E is available with the new No. 456 LOWBOWL Scraper, or the new W20 Wagon. Wagon capacity—20 cu. yd. struck.

"BIG PRODUCTION" FEATURES OF THE NEW DW20-DW21

MORE POWER—300 HP at 1800 r.p.m. Ten per cent more rimpull. New 6-cylinder, 5⅛ x 6½ inch Caterpillar Engine. Requires only one operating adjustment. Has hydraulic valve lifters—fan belt tension regulated by convenient capscrew-adjustment of generator.

NEW TURBOCHARGER, driven by engine exhaust, utilizes energy which would otherwise be lost. Packs air into engine according to engine load, not speed. Delivers more working HP—greater performance.

NEW, BIG WIDE-SECTION 29.5-29 TIRES, developed after 3 years of Caterpillar and tire manufacturer research, have proved a success in extensive tests on actual earth-moving jobs. Operating at lower pressures and providing big-footprint flotation and wide-lug traction, they're standard on the new DW20-DW21. Optional—24.00-29 tires.



INCREASED HIGH APRON L provides faster ejection of material.

INCREASED SCRAPER GROU CLEARANCE enables units work even under extremely "s conditions.

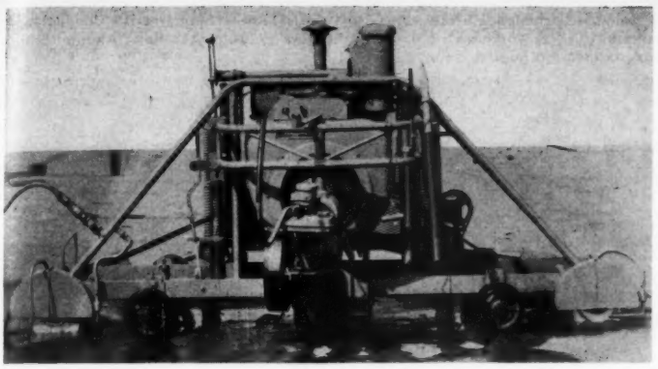
HIGH SPEEDS FOR FAST HAULS:
DW20 (Series E), 2.8 to 32.1 m.p.h.
DW21 (Series C), 2.3 to 20.5 m.p.h.

CHOICE OF STARTING METHODS, optional 24-volt rect electric or gasoline starting engine with 6- starting motor.

LARGE AREA PUSHBLOCK gives better pusher cont faster loading.

AUTOMATIC CABLE SAVER standard equipment.

Plus improved brake control, more easily removed DW20 hi arrangement, better protected DW21 hydraulic steering syst and many other new and thoroughly tested Caterpillar featu



Equipped with three blades, this new Cutcrete joint saw is designed to cut transverse joints on 12-foot-wide slabs.

Three-blade joint saw is lightweight model

■ A lightweight three-blade concrete saw designed to cut transverse joints on 12-foot-wide highway slabs has been announced by Concrete Machinery Ltd., California distributors of Cutcrete concrete saws. Reported to do the work of three conventional concrete-cutting saws, the new joint saw weighs slightly more than a conventional single-blade unit.

Cutting speed is said to be 4 or 5 times that of the standard machines. It is emphasized that this represents not only a saving in working time, but also in personnel. One operator is required to run the new machine.

Each of the three blades cuts a 4-foot swath, with the machine making a 12-foot cut in one operation. Cutting depth is 2 inches.

Power is supplied by a Wisconsin 36-hp air-cooled engine, and the saw is equipped with a self-propelled reversible traction clutch.

For further information write to Concrete Machinery Ltd., Pasadena 8, Calif., or use the Request Card at page 18. Circle No. 263.

Engine-oil refiner removes suspended solids and colloidal impurities

■ An oil-refining unit for all makes of trucks, tractors, cars, engines, and hydraulic oil systems is described in literature from Luber-Finer, Inc., 2514 S. Grand Ave., Los Angeles 7, Calif.

The Luber-Finer unit insures that engine lubricating oil will remain clear, of good color, and have an excellent lubricating quality for several thousand miles. It removes not only suspended solids from the oil, but also acids and colloidal impurities which are often more injurious than the larger-size suspended particles.

Luber-Finer packs are available in two types. A refining pack is offered for use on straight mineral oil, synthetic oils, diesel-fuel oil, and hydraulic fluids. A Dieselpak is especially designed and recommended for use with all detergent-type compounded oils. It has the ability to remove the most finely dispersed contaminants without removing or affecting the additives.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 290.

Building congress elects new officers at meeting

Officers for the New York Building Congress, Inc., were elected recently at the association's thirty-fourth annual meeting in New York City. John F. Hennessy, a partner in the New York, N. Y., engineering firm of Syska & Hennessy, Inc., was named president.

The five vice presidents elected were Max Abramovitz, of the architectural firm of Harrison & Abramovitz; John J. Brennan, secretary-treasurer of the Building and Construction Trades Council of Greater New York, Long Island, and vicinity; Vernon Jarboe, of Gens-Jarboe, Inc., contractors; A. Walter Nelson, vice president of General Bronze Corp.; and H. C. Turner, Jr., president of Turner Construction Co. Otto L. Nelson, vice president of New York Life Insurance Co., was elected treasurer. Charles A. Selby, vice president of Paul Tishman General Contractors, Inc., will serve as chairman of the finance committee. The new secretary is Bradford N. Clark, Eggers & Higgins, Architects.

RS. AND THE NEW
LOWBOWL SCRAPERS

Cat DW20 and DW21 Tractors and their matched scrapers have won world-wide acceptance as the standard of money-making performance among earth-moving haulers.

Now Caterpillar offers you two new pacesetting machines in the DW20 Series E and the DW21 Series C and their matched scrapers with exclusive **LOWBOWL** design.

Everything about these high-speed, high-capacity rigs contributes to BIGGER production. The new **LOWBOWL** design of the scrapers utilizes tractor and pusher power at maximum efficiency. The result: bigger loads and faster loading times. Feature after feature, many of them described briefly here, add up to a new profit-making potential for users. Get the full facts from your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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NEW DW20-DW21
—GIANT EARTHMOVERS

W LOWBOWL DESIGN PAYS OFF IN BIGGER, FASTER PAYLOADS

No. 470 Scraper with **LOWBOWL** design

Both scrapers were loaded with the same material obtained under identical conditions. Result: in the No. 470 a net load weighing 5000 pounds greater than the load in the No. 21—a profitable margin for **LOWBOWL** design!

Both No. 470 and No. 456 feature this new concept. The bowl has been widened and lengthened, yet bowl depth has been lowered. Horsepower is utilized more efficiently. Material is loaded with less resistance clear out to the end of the loading cycle. Result: faster loading for **LOWBOWL** design!

Sideboarded No. 21 Scraper

ANOTHER EXAMPLE OF CATERPILLAR LEADERSHIP IN ACTION

A Hough Payloader equipped with a fork loads a trailer with pallets which will be laid down on the ground to support the first pour of a pile of mattresses. The machine also handles forms and other materials at the site. *C&E Staff Photos*

As concrete is dumped to the forms from the side-gate hopper body on an International truck, a workman manipulates the gate to control the flow. Another workman scrapes the hopper clean.

Assembly-line method speeds casting of concrete mats

Specialized equipment daily turns out 1,000 "squares" of articulated mattresses for river revetment construction

by RALPH MONSON, field editor

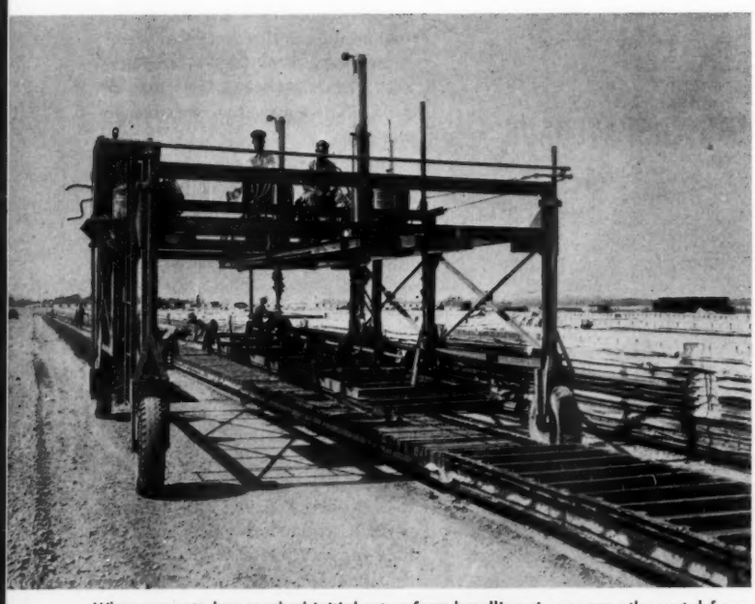
Articulated concrete mattresses for river-bank protection projects are being mass-produced by an adaptation of the assembly-line method. But instead of the product moving by on a conveyor, the train of machinery moves along, leaving the finished product behind.

Using this highly mechanized process with a number of unique pieces of machinery, Warren Bros. Roads Co., Inc., Cambridge, Mass., is producing 100,000 "squares" of the reinforced-concrete mattresses for the U. S. Army Corps of Engineers at the Greenville, Miss., casting yard.

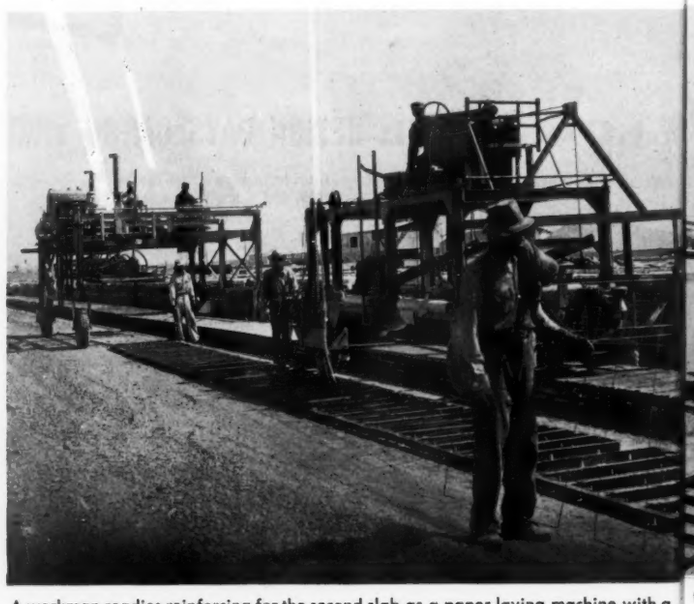
Used extensively in revetment work along the Mississippi River and its tributaries, the articulated concrete mattress consists of a series of 3-inch-deep concrete slabs approximately 14×46 inches in size. Twenty such sections are cast as a unit, and continuous corrosion-resistant wire-mesh reinforcing ties them to a mattress measuring about 4×25 feet. This mat, which protects 100 square feet of river bank, is called a "square."

Under the procedure used by Warren Bros., the mattresses are cast on wooden pallets laid on the carefully graded casting field in long continuous rows. Concrete is placed in the steel forms and finished by a series of machine operations. After the forms are removed and the concrete allowed to acquire initial set, a double layer of kraft paper is placed over the first tier of mattresses. The same procedure is followed to cast another layer on top of the first tier.

This process is repeated until 13 layers of mattresses are built up. Then another row of pallets is laid



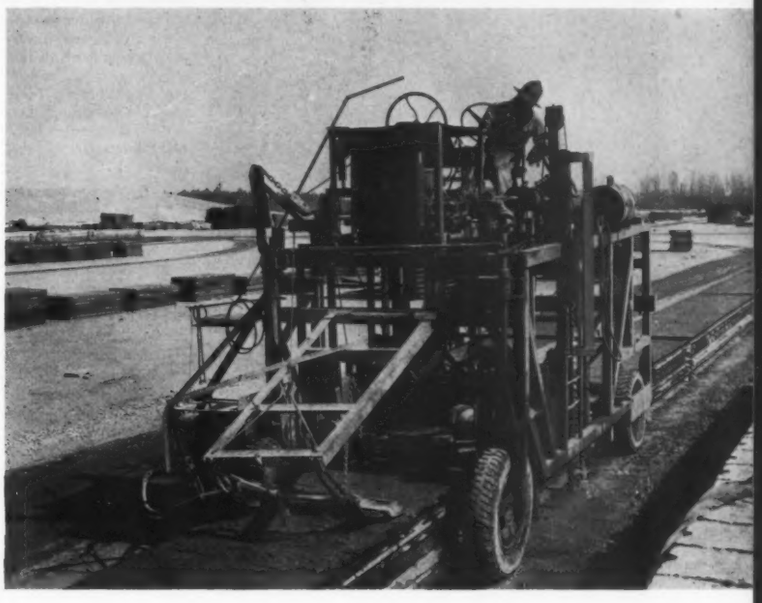
When concrete has reached initial set, a form-handling rig removes the metal forms and places them beside the casting bed. The machine, propelled by a Farmall tractor engine and drive, has a Le Roi engine and compressor to power the lifting arms.



A workman readies reinforcing for the second slab as a paper-laying machine with a rotary sweeper removes all loose material from the concrete and lays a double layer of kraft paper over the mattress already poured. The form-laying machine follows.

A shop-made strike-off spreads concrete across the width of the 3-inch-deep form. If additional concrete is needed to fill the form completely, it is added by workmen following the machine.

A finishing machine has a Wyco mechanical vibrator hung from an arm at the front of the rig to vibrate the concrete. A four-blade rotary trowel works the surface, and a reciprocating finishing shoe completes the work.



parallel to the pile of completed mats, and the process is started again. Using a crew of about 100 workmen and a spread of specially designed equipment—most of which was built in its shops—Warren Bros. is producing at the rate of 1,000 to 1,200 squares per eight-hour day.

Concrete produced at site

Concrete is mixed in two Koehring 56-S mixers in a big concrete plant set up at one edge of the casting yard. Aggregates produced from river deposits by Greenville Dredging Co., Inc., Greenville, Miss., are delivered by barges to a dock adjacent to the casting field. A Marion 362 crane with an Erie 1½-yard clamshell bucket transfers the sand and gravel from the barges to a hopper which serves as a surge bin.

From this bin, dump trucks haul the materials to stockpiles located over Armco 84-inch recovery tunnels which extend out to both sides of the plant. Sand is stockpiled on one side and gravel on the other. Two Caterpillar D8 tractor-dozers maintain the stockpiles and also switch cement cars. Manually operated gates control the flow of gravel from the stockpile to the belt inside the tunnel. Sand is fed to the other belt by a Syntron vibrating feeder.

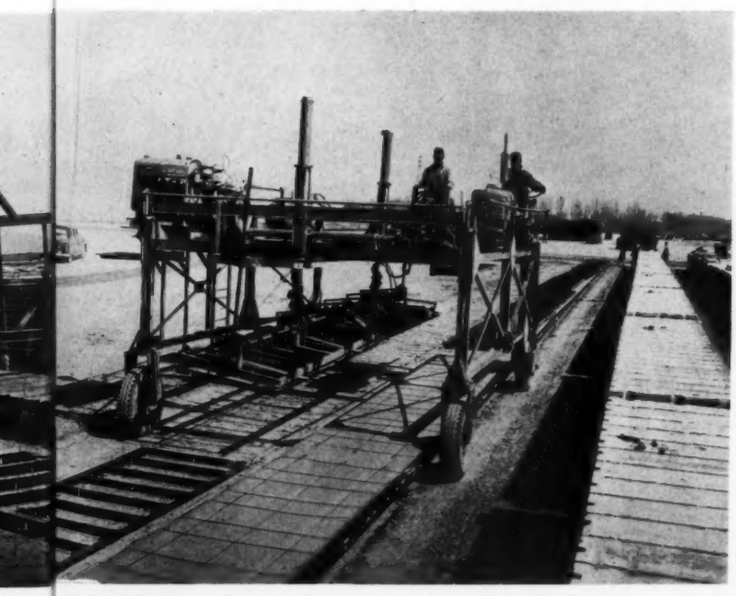
Conveyor belts from the tunnels discharge into the boots of twin bucket elevators on the two sides of the plant. These elevators raise the aggregates to the Blaw-Knox storage bins at the top of the plant. Cement received in bulk cars is transferred to the center section of the bins by a Blaw-Knox screw and elevator.

A typical 2.2-cubic-yard batch of the 3¾-bag mix contains 2,725 pounds of sand, 4,313 pounds of gravel, and 776 pounds of cement. Vinsol resin air-entraining agent is added to produce 5 to 6 per cent air in the mix as placed. The water-cement ratio is held below a 7.5 maximum.

Batches are weighed from the bins by Howe scales and discharge to the two Koehring 56-S mixers on the first platform of the plant. These mixers dump directly into special hopper bodies on the trucks which make the pours. These shop-built bodies have a capacity of 2.2 cubic yards, enabling them to take a full batch from the mixers. The sloping sides of the batch body terminate at a manually operated gate on the left side of the truck. The bodies are mounted high enough on the trucks so that the concrete can be sent to the forms through a short chute, even when the stack of mattresses is more than three feet high.

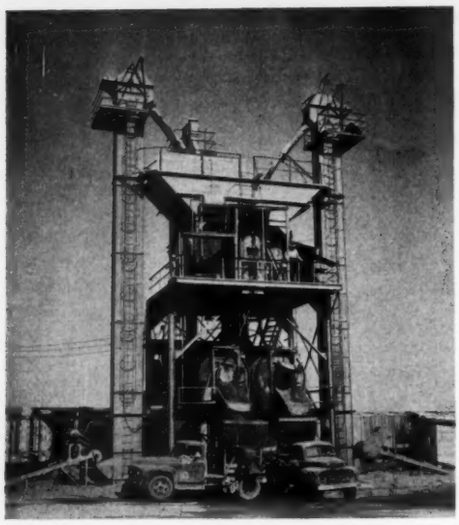
Pallets, forms, reinforcing, and the casting field are supplied by the U. S. Army Corps of Engineers. The field is a carefully graded area of about 100 acres, finished with a well stabilized gravel surfacing. It lies between the Mississippi River and the main line protection levee at the south end of Greenville. Although the area is normally well above river level, there were several times in past years when work on this field was interrupted by high water.

Individual pallets measure about 4×6 feet, and four pallets are required to support each mattress. A Hough Payloader equipped with a fork attachment handles the pallets



With reinforcing in place over the paper, a form machine rides along, setting a form on the paper. The wire mesh will be raised to the center of the section and locked in place during the placing and finishing operations.

The last step in preparing the forms for concrete is the application of form oil to the metal forms and the paper separator. This is done by a Farmall tractor equipped with a pump, supply tank, and sprayer.



Cement transferred from railroad cars to bins, and aggregates carried to other bins by bucket elevators at the sides of the Blaw-Knox plant, are batched into a pair of Koehring 56-S mixers. Ford trucks with side-dumping hopper bodies haul wet batches to the pour.

in stacks. On long moves, the Payloader stacks the pallets on a long trailer which is pulled by a truck.

The steel form sections are the same size as the pallets. Each section forms five of the 14×46-inch units, and four sections are locked together to form a complete mattress. The vertical legs of the forms have notches which permit the reinforcing mesh to be raised to the center of the section. Sliding bolts lock the reinforcing in this position during the placing and finishing operations.

At the start of the casting operation, the pallets are strung out in long straight rows which run the full length of the casting field. A short space is left between adjacent mattresses in the row, and larger openings for roadways are left at convenient intervals. From this point on, the production line procedure prevails.

Specialized machines

Most of the machines being used in the casting operation are designed to straddle the row of mattresses. Therefore, most of them bear some resemblance to the straddle-type lumber carrier. All of them were specially built in the Warren Bros.' shops for the specific work they perform.

The paper machine is first in the train. A rotating sweep on the front of the machine sweeps the pallets or mats clean as it moves along. Kraft paper 50 inches wide feeds from two rolls on the rear of the machine, laying a continuous double layer of paper over the pallets or freshly cast mats the full length of the run. Workmen follow the machine to place the prefabricated reinforcing mesh on the paper.

Next comes the form-handling machine, the giant of the train which appears to be twice as wide as the other machines. As it straddles the row of pallets and a row of forms lying on the ground beside the pallets, arms operated by air cylinders reach down and mechanical fingers grasp the top flanges of the forms. The machine lifts the form section for a complete mattress, transports it laterally, and lowers it into place on the pallets or mats. This machine is propelled by the power and drive units of a Farmall tractor mounted high on the frame and driving the wheels through chains. Air for operating the lifting mechanism is supplied by a Le Roi engine and compressor mounted opposite the drive engine. The air-operated cylinders are very fast, and with two operators the machine places forms at an amazing rate of speed.

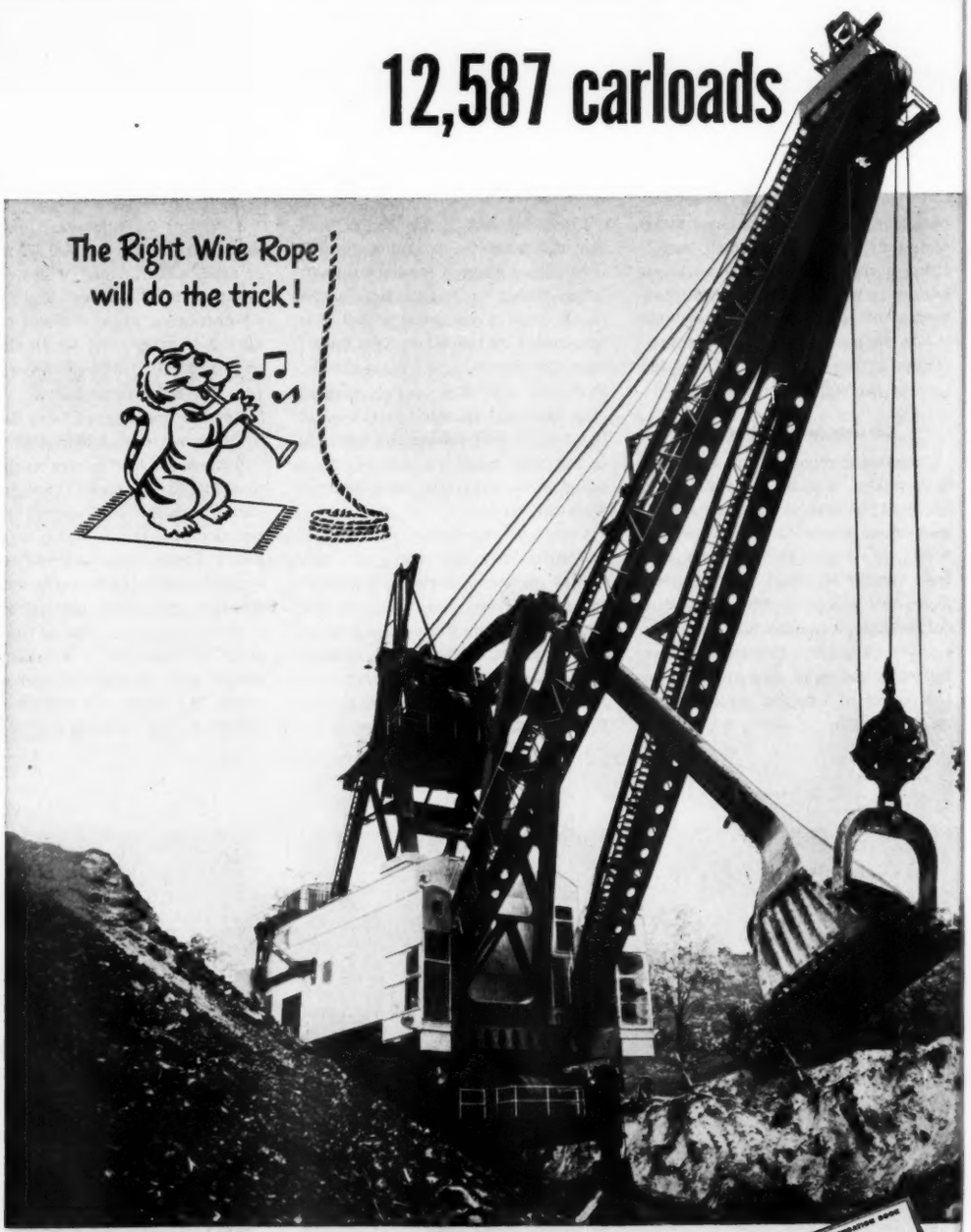
Raising the reinforcing into the form notches and locking it in place is a hand operation. As soon as the reinforcing is in place, the form and the paper are sprayed with form oil by a specially equipped Farmall tractor. This tractor has a pressure tank and pump mounted on one side and an extension arm which supports eight spray nozzles. As the tractor moves along, the nozzles apply a uniform coating of oil to the forms and the paper.

One of the concrete trucks then pulls up beside the form, and as a workman adjusts the cutoff gate on the side-dump batch body of the truck, the concrete is deposited continuously down the middle of the form. Driver and gate operator have become skilled at placing the proper amount of concrete to fill the forms.

A machine strikes off and spreads the concrete across the width of the form, and a small crew and a truck follow to add concrete, where necessary, to fill the forms completely.

A finishing machine completes the work in a series of operations. A floating vibrator plate equipped with Wyco mechanical vibrator is hung from an arm which projects ahead of the machine. This is followed by a

12,587 carloads



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rotary trowel and a reciprocating shoe which complete the job.

Forms removed early

As soon as the concrete has attained its initial set, the forms are removed. Workmen first unlock the bolts which hold the reinforcing in place. Forms are then pulled by a small hand crew and laid on the new concrete. Then a form handling machine picks up the form section and places it on the ground beside the mattress. The process is now ready to be repeated. Within a few hours after the first mattress is cast, the paper machine is back spreading a layer of paper over the mattress which has just been cast. The steps are repeated to cast one layer on top of another until the pile reaches a height of 13 layers of mats. Then a new set of pallets is laid down beside the first row and the entire operation starts again.

In order to provide for curing, the surfaces of the newly cast mattresses are sprinkled with water at varying intervals, depending on the weather, until the next layer is placed. When the stack of 13 has been completed, the top layer is sprayed with Hunt Process white-pigmented curing spray to seal in moisture.

The combination of standard concrete-producing equipment and specialized machines for the casting operations results in a fast systematic operation requiring a minimum of labor. Supervising this project for Warren Bros. Roads Co., Inc., is Fred G. Baker. He is assisted by Robert Titcomb, engineer, and J. C. Passman, field superintendent. The contractor's field office is a specially furnished M System trailer coach.

Aggregates, unloaded at a dock near the casting field, are transferred to a surge bin by a Marion Model 362 crane with ½-yard clamshell bucket. The Ford dump truck loads up with sand for the batch-plant stockpiles.

The project is being done for the Vicksburg District of the U. S. Army Corps of Engineers, of which Col. Thomas B. Simpson is district engineer. Area engineer at Greenville is W. H. Deese. This project is being supervised by T. W. Register, assistant area engineer, and H. T. Stennis, field engineer. The construction division of the Vicksburg District is assisting the contractor by helping check the mix design and making available technical advice on some phases of the work. R. H. Shackelford and Sam Hernandez of the bank-protection section of the construction division are also providing technical assistance. THE END

overburden moved with one Tiger Brand Hoist Rope

IMAGINE 12,587 50-ton freight cars strung out end-to-end. They would make a train more than 80 miles long; and if each car was level full, the entire train would contain 1,000,000 cubic yards of material. That's how much overburden this big coal stripping shovel moved with one American Tiger Brand Hoist Rope.

Despite hard digging, a 2⅜" Tiger Brand Wire Rope lifted and lowered the fully loaded 45 cu. yd. bucket *20,000* times before it had to be replaced. This equipment is used by Central Ohio Coal Company which supplies coal for The Ohio Power Company's new Muskingum River electric power generating plant. This company also uses Tiger Brand Wire Rope on its 18 cu. yd. shovels.

You will like Tiger Brand, too. It lasts long in *any* type of service.

Send the coupon for our recommendations of the right rope to use on your machines.

Regular lubrication of sheaves helps prevent excessive wear of the Tiger Brand Ropes on these big machines.

This 18 cu. yd. electric shovel and the 45 cu. yd. job shown on the opposite page are stripping overburden 3 shifts a day *every* day at Central Ohio Coal Co.'s big Muskingum Mine near Zanesville, Ohio. Tiger Brand Rope is giving excellent service on both these hard-working machines.

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Handbook treats uses of precast concrete

Existing practice in the use of precast reinforced concrete is surveyed in a new handbook, "Precast Concrete", published by D. Van Nostrand Co., Inc., New York, N. Y. Written by Dr. Kurt Billig, internationally known authority on concrete technology, the 332-page well illustrated work treats the whole subject of precast concrete.

Principles, design, and production are studied in an opening section. Precast units and structural members are discussed in the second section, and another part of the book is devoted to the subject of joints. The major portion of the book is given over to a report on use of precast concrete in structures of all types.

Drawings, photographs, diagrams, and charts illustrate the entire book, with approximately 70 illustrations detailing application of the precast-concrete method in specific projects. A chapter is devoted to the uses of prestressed concrete structural members.

"Precast Concrete" may be ordered from D. Van Nostrand Co., Inc., 250 Fourth Ave., New York, N. Y., at $7.50 a copy.

New 6-ton self-propelled shovel-crane designed to work in close quarters

The new Schield Bantam Model CR-35 self-propelled excavator-crane has a 19½-foot turning radius.

■ A new self-propelled ⅜-cubic-yard 6-ton shovel-crane has been announced by Schield Bantam Co., Park St., Waverly, Iowa. The Bantam Model CR-35 features a 12,000-pound lifting capacity and an outside turning radius of 19½ feet. The machine has the maneuverability needed for getting into tight working quarters with heavy loads.

Another important feature of the new Bantam is two-speed independent travel, which allows the operator to work the upper deck machinery and travel at the same time. The steering mechanism and brakes are controlled hydraulically, while the travel mechanism and upper machinery operate on a mechanical-control principle.

Wheelbase of the new machine is 112 inches. Over-all length is 173¼ inches, width is 96 inches, and height, 125 inches. The machine has a 4 × 2 drive and is mounted on 8.25 × 20 tires. A fully-enclosed bevel-gear drive is used at the lower end of the vertical drive shaft to transmit drive to the rear axle. Four travel speeds in both forward and reverse range from 1.06 to 5.54 mph.

The unit's frame is made of 12 × 6½-inch-flange beam weighing 31 pounds per foot. A front outrigger is welded permanently to the frame. Beams extend from the side 22 inches beyond the box. The rear outrigger has a box-and-frame section fastened to the frame proper by two pins and two bolts so that this section can be removed when excavating attachments are to be used.

The upper deck basic unit features the same design as that of the Bantam Model T-35 truck and Model C-35 crawler models. A power boom hoist, which is standard equipment on all Bantam models, offers power-controlled raising and lowering of loads.

The full-revolving self-propelled rig has a swing speed of 6.65 rpm and a line speed of 176.5 feet per minute. Other standard Bantam features include antifriction bearings, machine-cut gears, internal-expanding band-type "snap-in" clutches with molded linings, external contracting brakes, and four trunnion rollers and four cam-type adjustable hook rollers to distribute load weight evenly over the trunnion base.

A newly designed cab gives the operator 360-degree visibility. The cab offers easy access to all working parts for repair, servicing, and adjustment.

Nine attachments are quickly interchangeable on the model. These include crane, clamshell, dragline, shovel, trench hoe magnet, grapple, pile driver, and backfiller.

For further information write to the company, or use the Request Card at page 18. Circle No. 284.

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Bid lower- Finish jobs faster- make more per contract

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GENERAL MOTORS DIESEL POWER

In all your construction equipment

"Works faster... burns less fuel... costs less to maintain."

That's what these contractors—operating *seven* different kinds of General Motors Diesel-powered equipment—report about their GM Diesels. They've got on-the-job proof that a GM 2-cycle Diesel does more work at less cost on every construction job.

If your business is building anything from sewers to skyscrapers, you'll find a good way to build your business is to *specify* a GM Diesel when you buy equipment.

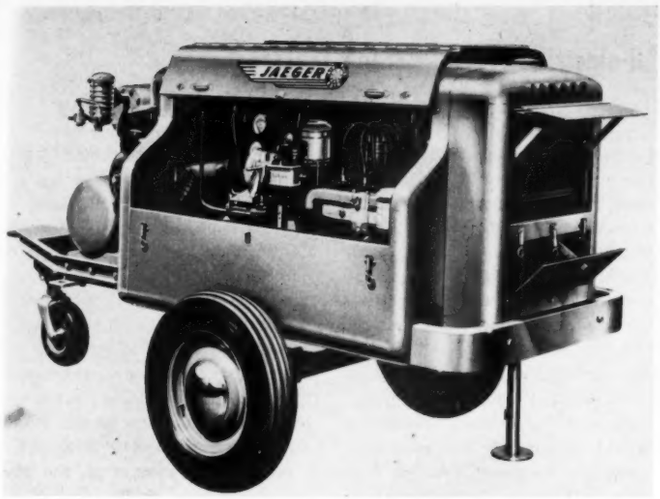
For this quick-acting 2-cycle Diesel accelerates faster under load, burns fewer gallons of low-cost fuel, stands up better even in toughest working conditions. You won't need service often but, when you do, your GM Diesel distributor backs up engine performance with fast service and quick delivery of low-cost parts, no matter where your contracts take you.

Today you can get GM Diesel power in over 750 different models of equipment built by more than 150 different manufacturers. Get their names from your local GM Diesel distributor or write direct for the list.

25% MORE WORK AT HALF THE FUEL COST

California contractors McGuire & H[ickeye] report they're getting 25% more wo[rk] and spending 50% less for fuel—[a Ho]w with they converted this ¾-yard dragline [mechanic] *gasoline to General Motors Diesel power.* The compact "4-71" GM Diesel did such a good job that the contractor repowered two more shovels with GM Diesel.

GM GENERAL M[OTORS] DIES[EL] POW[ER]



Efficient new rotary compressors feature slower operating speeds and close control

■ An improved type of two-stage air-cooled rotary air compressors in 125 and 600-cfm sizes has been placed on the market by the Jaeger Machine Co., Columbus 16, Ohio. Designed to run at slower operating speeds, the new Jaeger Roto compressors offer economies in fuel and engine wear. The units retain the characteristic rotary advantages of fewer moving parts, lighter weight, cooler air temperatures, and complete absence of vibration.

Jaeger's new Roto compressors are designed for slower operating speeds.

According to the manufacturer, close continuous control of engine and compressor has been developed to the point where 100 pounds minimum pressure can be constantly maintained over the entire operating range. All speed modulation is smooth and stepless. Instantaneous control prevents over-run and racing of the engine. A further advantage is simplicity of control. There are no metering orifices, complex linkages, or toggles. Starting and stopping require only a half-turn of a regulator crank.

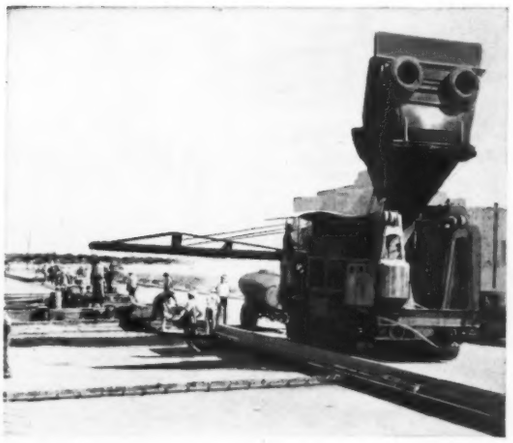
A copper-tube, finned, multipass oil cooler insures cool operation in ambient temperatures exceeding 100 degrees. In cold-weather starting, oil is automatically by-passed to the compressor cylinders to protect against dry starts. Improved radiator shutters also provide a complete range of adjustments insuring proper engine-water temperature in sub-zero weather.

Other features include accessible 8-hour fuel tanks and wrap-around bumpers. The Roto models are equipped with tool boxes large enough to carry a complete set of air tools. A-frame tow bars have a spring-loaded eye and a retractable pneumatic-tire dolly wheel.

For further information write to the company, or use the Request Card at page 18. Circle No. 304.

ORKS ⅓ FASTER—CUT FUEL COSTS 60%

laryland contractor Charles F. Knox, Jr., reports he gets more production, has cut fuel costs 60%, since he con-rted this ¾-yard shovel from *gasoline to GM Diesel wer*. The shovel works 8 to 10 hours a day, costs far ss to maintain. You can specify GM Diesel power in over shovel models built by more than 20 manufacturers.



PAVES 1400 FEET A DAY

This Koehring Paver, powered by a compact, quick-accelerating GM 2-cycle Diesel, lays 1400 feet of 25-foot wide pavement per day for the Austin Road Company of Dallas, Texas. You can lay pavement faster and at less cost with GM Diesel power—available as original equipment in 8 paver models made by 4 different manufacturers.

ASTEST DITCHER IN THE AREA"

cGuire & Hester *specified* GM Diesel power in two new ckeye Ditchers and a Lorain Crane, as well as repower-a Hough Payloader, after getting *more work at less* with GM Diesel power in their dragline. The master chanic calls this GM Diesel-powered Buckeye Ditcher stest in the area."

NO REPAIRS IN TWO YEARS

These GM Diesel-powered LeTourneau-Westinghouse Tournapulls worked over two years in flying abrasive dust without losing a day for repairs, reports Arizona contractor Link L. Colvin. In every kind of earth-moving equipment GM Diesel power lasts longer, works faster, costs less to run and maintain.

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 30 to 300 H.P. • Multiple Units . . . Up to 893 H.P.

Concreting method speeds Mackinac bridge job

■ Placing concrete by the Prepakt method is providing economy, speed, and flexibility of operations in the pouring of 34 foundation piers on the Mackinac Bridge, according to a new booklet.

The five-mile long bridge, connecting Michigan's upper and lower peninsulas, is consuming approximately 440,000 cubic yards of concrete for the substructure. Some 350,000 cubic yards is being placed under water at depths which exceed 200 feet. The contractor for the substructure is Merritt-Chapman & Scott Corp.

Prepakt concrete is made by preplacing coarse aggregate in cofferdams, caissons, and forms, then consolidating the stone into concrete by pumping all voids completely full with intrusion mortar.

For the Mackinac project, stone is being deposited directly into cofferdams from self-unloading boats at rates up to 2,500 tons per hour. Thus, over 60 per cent of the total concrete volume does not pass through concrete mixers and is not subject to their speed limitations. As a result, a smaller more economical plant can be used to batch, mix, and pump the intrusion mortar, which is less than 40 per cent of the total volume.

To obtain this literature write to Prepakt Concrete Co., Division of Intrusion-Prepakt, Inc., Union Commerce Bldg., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 318.

A platform at the front of the crane holds the load so that the machine can haul it safely and fast. The platform can also be used to take on extra counterweight as needed.

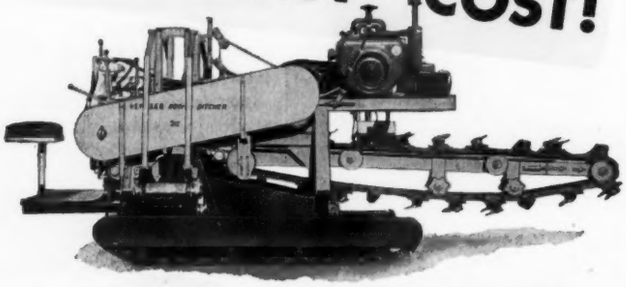
All-electric revolving crane features independent control of each function

■ A mobile revolving crane of medium capacity featuring all-electric power has been introduced by R. G. LeTourneau, Inc., Longview, Texas. Designed to lift, carry, and spot loads, the crane is propelled by individually-powered electric wheels, each with its own drive motor. This gives the machine the ability to travel over any kind of ground, since even if some of the wheels lose their footing, power continues to be available on the remaining wheels. Big and wide tires provide the necessary flotation.

The LeTourneau electric drive system—used for the first time on a machine of this kind—makes each crane function completely independent of the others. Every moving structure has its own motor at the point of power application, and its own cab-controlled circuit. This means that the operator can travel, steer, swing, hoist, and boom—simultaneously, independently, or in any combination. Furthermore, the electric drive system eliminates shafts, clutches, and other conventional power couplings.

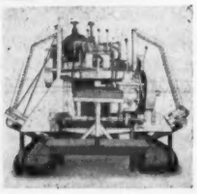
As a safety precaution, the machine has been designed with in-

GET BIG DITCHER PERFORMANCE AT LOWEST COST!



IT'S HEAVIER! IT'S STRONGER! IT'S LARGER!

NEW VERMEER MODEL 524T POW-R-DITCHER



DIGS 8", 10", 14", 18" and 24" WIDE and DOWN TO 6 FEET DEEP

Overhead Action View

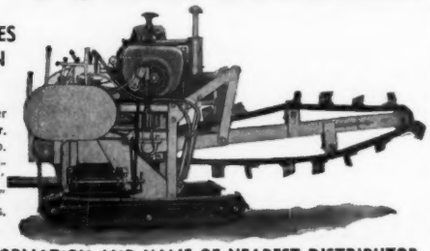
Front View

Here's the *new 524T* POW-R-DITCHER . . . it's heavier, stronger, more rugged! Ideal for contractors, municipalities, utility companies, etc. A *low priced ditcher* that does the work of more expensive ditchers and trenchers . . . at a fraction of the cost! 5-speed International Truck Transmission. Hydraulically engaged steering controls. Weighs 5400 lbs. Ruggedly built and designed to handle wide foundation footings, gas, water and sewage lines. Get all the details NOW on the *524T!*

ALSO NEW... MODEL 4T POW-R-DITCHER

FOR GAS PIPE, CABLE LINES & HOME CONSTRUCTION ONLY 42" WIDE!

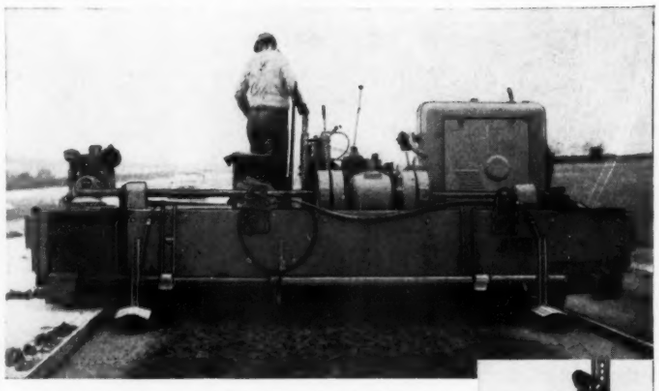
Here's the Vermeer Midget ditcher . . . the **Model 4T Pow-R-Ditcher.** Self propelled by 15 or 25 hp. Wisconsin Engine. Can be transported in a pickup truck. Only 6' high, 13' long. Digs 6" to 14" wide, 4' deep. Weighs 2500 lbs. A real workhorse!



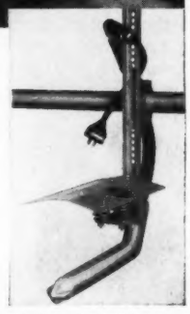
WRITE FOR COMPLETE INFORMATION AND NAME OF NEAREST DISTRIBUTOR

VERMEER MFG. CO., Pella, Iowa

Cut Paving Costs with Maginniss Side Form Vibrators



Maginniss Vibrating Attachment at work on the Ohio Turnpike. Note vibrated concrete near side forms.



Model HPV-3 Hi-lectric paving vibrator—heart of Maginniss side form vibrating attachment.

Fifteen Maginniss side form vibrator attachments are now in use by paving contractors on the Ohio Turnpike.

Mounted on Blaw-Knox and Jaeger spreaders and finishers as well as Heltzel telescoping finishers, these vibrators are reducing paving costs—increasing production efficiency every day!

The Maginniss side form vibrator attachment, easily mounted on machines from 12 to 24 feet wide, consists of 2 Hi-lectric, 180 cycle motor-in-head vibrators spring mounted on a shaft and hanger. Position of the vibrator heads, which ride completely submerged in the concrete for maximum vibrating efficiency, is controlled by a hand lever. There are no cumbersome flexible shafts or external drive units.

Powered by a 120 volt, 180 cycle gasoline engine-driven generator mounted on the spreader or finisher, the vibrators produce up to 10,500 VPM—can be mounted as much as fifteen inches in from the side forms and still vibrate concrete effectively at the forms, leaving it free from honeycomb.

The Maginniss side form vibrator attachment eliminates the need for hand labor—cuts costs—produces better paving. Ask your Maginniss distributor for all the facts. You'll find him listed in the Yellow Pages.

Actual photo showing honeycomb left in slab before Maginniss attachment was installed.

Photo of slab on same job showing dense, sound concrete consistently produced by Maginniss Side Form Vibrators.

Maginniss HI-LECTRIC POWER TOOLS

AA-1708

MAGINNISS POWER TOOL COMPANY

154 DISTL AVENUE • MANSFIELD, OHIO

With separate electric motors driving each wheel, the new R. G. LeTourneau revolving crane can haul loads over marshy terrain without difficulty.

tegral motor brakes which set automatically and hold capacity loads whenever power is interrupted. A further feature of the LeTourneau control system is the use of limit switches on driven components to break power circuits and set individual motor brakes whenever the desired limitation of boom travel is reached.

The manufacturer describes this equipment as a 150-foot-ton crane. This rating is the product of the tonnage lifted times the number of feet out at which the load is held. It means, in this instance, that the crane will lift a maximum of 15 tons when the load is 10 feet out. At greater distances the lifting capacity, of course, decreases, with the product of the maximum load (in tons) times the distance from the center of rotation (in feet) always equal to 150 foot-tons.

A heavy cargo platform at the front end of the new LeTourneau revolving crane serves a dual function. On lift, carry, and spot jobs it provides a firm and safe bed for cargo, permitting faster travel under load. It also serves as a holder for extra counterweight for capacity lifts. The crane operator may load any heavy material to provide the extra weight needed, and permanent counterweights can be installed when economical.

Another innovation on the new crane is electric-powered outriggers, that project diagonally from the rear of the crane. These are set and retracted in response to switch controls in the operator's cab. Again, an electric motor powers each outrigger individually.

A diesel or a gasoline engine, direct coupled to a LeTourneau electric generating system supplies the power for the work motors.

For further information write to the company, or use the Request Card at page 18. Circle No. 314.

H. A. Levonian is named Kuljian vice president

The new vice president in charge of consulting engineering for The Kuljian Corp., engineering and constructing firm of Philadelphia, Pa., is Hilton A. Levonian. In his new position, Mr. Levonian will be in charge of cousulting engineering.

Over 9,000 square feet of prefabricated forms were used to form 300,000 square feet of concrete walls. Nori Construction Co., Millbury, Mass., Gen. Con.

Symons Forms Cut Forming Time in ½ on Tantasqua High School

A thorough study of the problem of forming walls and flat slabs was made by the contractor of the $2,000,000 Tantasqua High School at Sturbridge, Massachusetts.

The contractor chose Symons Pre-Fab Concrete Forms due to two advantages: 1) Wall pours could be completed in less time and at a faster rate; 2) The forms could be used at a greater cost saving. Overall cost of all forming was 18 cents per square foot, including erection, stripping and transportation time. This figure was under half his previous cost for similar work.

Symons offers a complete engineering service. Send for Catalog F-10 which gives complete information on the Symons system and service. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. G-5, Chicago 39, Illinois.

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VICTOR for welding

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For Manual Application

THIS HARD-FACING ROD	FOR THESE CONDITIONS	FOR THIS EQUIPMENT	APPLI-CATION
VICTORTUBE	Severe abrasion	Scarifier teeth, dredge cutter blades, posthole augers, oil field tools, ditcher teeth	Acety. AC-DC Elec.
VICTORTURE "SPECIAL"	Abrasion, severe impact	Oilfield bits, rock bits	Acety. only
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutters, brick augers, pug mill knives, screw conveyors, farm tools	Acety. AC-DC Elec.
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides	Acety. AC-DC Elec.
TUBE VICTORITE	Abrasion, impact	Plow points and farm tools	Acety. AC-DC Elec.
VICTORITE 1	Corrosion, heat, abrasion	Saw teeth, carbon scrapers, wire guides, rocker arms, steel mill applications	Acety. AC-DC Elec.
VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies, cams, hot punches, pump shafts	Acety. AC-DC Elec.
VICTORITE 12	Heat, abrasion, impact	Saw blade inserts and other critical applications	Acety. AC-DC Elec.
VICTORITE CARBON ARC	High abrasion, thin deposit	Plowshares, lister shares, sweeps	Carb. arc Acety.
VICTORALLOY	Abrasion, severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers, roll crushers	Acety. AC-DC Elec.
VICTORALLOY #1	High abrasion, medium impact	Bucket lips, rock crushers, Muller tires, gyratories	Acety. AC-DC Elec.
VICTORALLOY "A"	Angular shock, extreme impact, build-up	Clutch parts, gears, crusher plates, gyratory mantles, build-up for hardfacing	AC-DC Elec. only
VICTORALLOY "B"	Heavy impact, moderate abrasion	Tractor rollers and sprockets, shovel pads, plates, idlers, etc.	AC-DC Elec. only
VICTORALLOY "C"	High abrasion, moderate shock and impact	Tractor grousers, pressure rolls, crusher segments, roll crusher teeth	AC-DC Elec. only

Also VICTOR Bulk Metals, VICTORITE Plow Point Bars, and VICTOR Super-Titan Blasting Nozzles

For Automatic Application

THIS TYPE	FOR THESE CONDITIONS	ON THIS KIND OF EQUIPMENT
VA #1	Abrasion, medium impact	Crusher rolls, crushers, gyratory crushers
VA #2	Abrasion, impact, Multi-pass application	Steel mill applications
VA #3	Abrasion, light impact	Mill guides, crushers, dredge bushings
VA #4	Multiple layer build-up	Tractor rails, crane wheels, general build-up
VA #5	Heavy impact, abrasion	Tractor rollers, idlers, mine car wheels, sheave wheels
VA #6	Medium abrasion, high impact	Crane wheels, drums, roll necks
VA #7	Abrasion, high impact	Build-up for hardfacing
VA #8	Abrasion, medium impact	Dozer bits, roll crushers, scraper blades
VT #60	Extreme abrasion	Tool joints, grader blades, scraper blades, augers

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H-11

Gardner-Denver wagon drills on the front of a Caterpillar D8, powered by a Gardner-Denver 600-cfm compressor on the rear of the tractor, put down blast holes.
Ray Day Photos

Rock outfit supplements earthmovers on road job

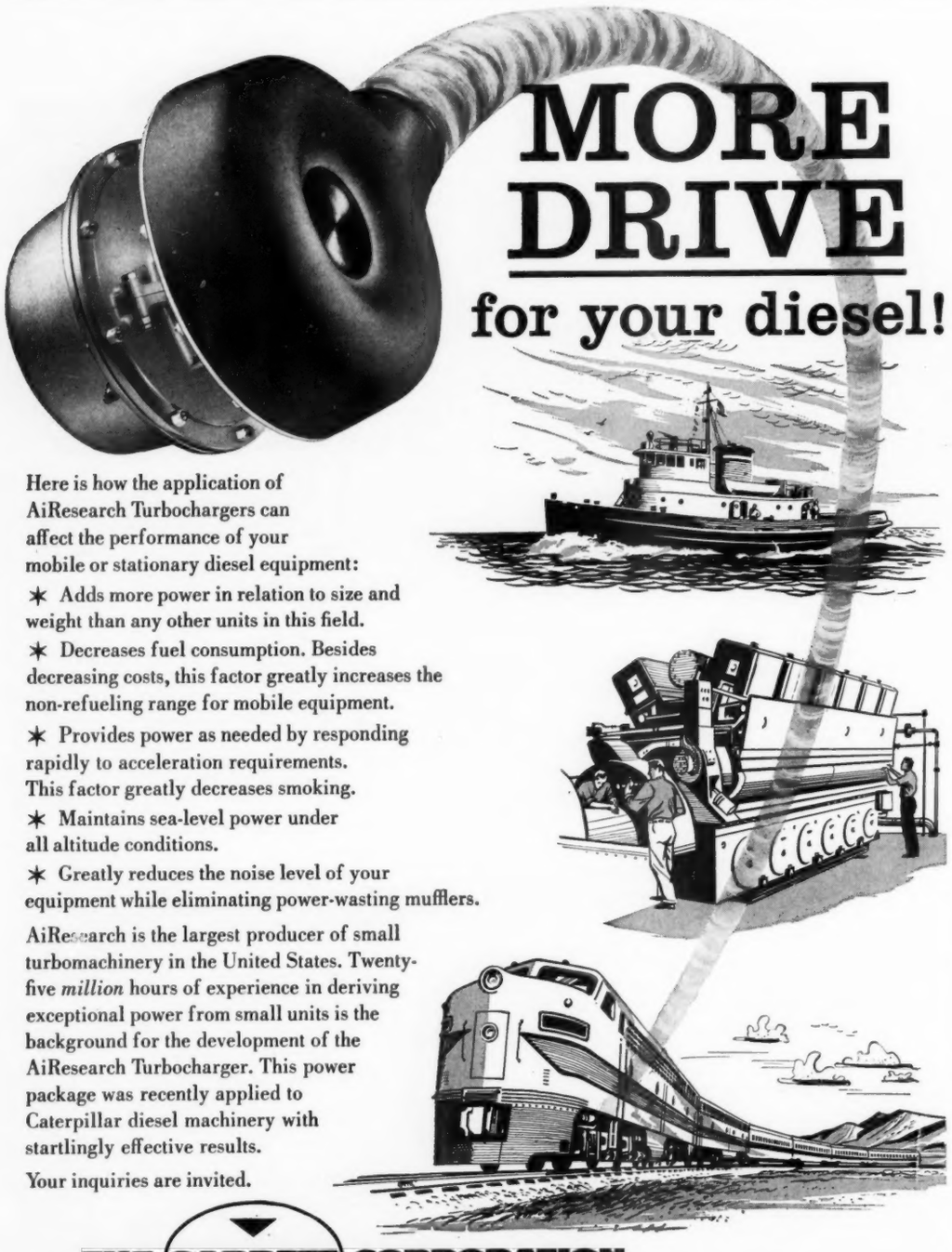
Heaviest work is concentrated in a 102-foot cut and 185-foot fill; much of the 1,100,000-yard excavation has to be handled twice

Excavation of 1,100,000 cubic yards of unclassified material on a 4.035-mile section of U. S. 87–89 near Great Falls, Mont., was a big enough earthmoving job to make for some tough road realignment work. But the rugged terrain, an excess of hard rock which required drilling, and congestion in the work area created additional problems for the contractor.

In one section alone, a 102-foot cut through a hill, a 185-foot fill in an adjacent gorge, and the cutting of sections from promontories along the right-of-way were required so that the road could bypass the town of Belt. This section required a fill, 594 feet thick at the base, containing nearly ¾-million cubic yards of material. And the fill had to be built in flat lifts so that maximum settlement could be developed.

Albert LaLonde Co., Inc., Sidney, Mont., now doing the job under a $736,589 contract with the Montana State Highway Commission, knew the job was going to be tough from the very beginning. Though the first surveys to relocate Belt Hill were made about 1931, it was not until 1941 that the job actually reached the planning stage. The work was opened to bid three times, and bids were rejected three times for being excessively high, before LaLonde was awarded the contract.

LaLonde's current work will transform the dangerous old road into a modern two-lane highway with a 40-foot standard roadbed top. In some places—such as the surface of the big fill—the road is 46 feet wide. All major cuts, including the large rock cut, have side slopes of 1½ to 1. Maximum grades are 6 per cent. Two 1-degree curves about 3,000 feet long are the sharpest on the road. The subgrade will consist of 8 inches of



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Here is how the application of AiResearch Turbochargers can affect the performance of your mobile or stationary diesel equipment:

✶ Adds more power in relation to size and weight than any other units in this field.

✶ Decreases fuel consumption. Besides decreasing costs, this factor greatly increases the non-refueling range for mobile equipment.

✶ Provides power as needed by responding rapidly to acceleration requirements. This factor greatly decreases smoking.

✶ Maintains sea-level power under all altitude conditions.

✶ Greatly reduces the noise level of your equipment while eliminating power-wasting mufflers.

AiResearch is the largest producer of small turbomachinery in the United States. Twenty-five *million* hours of experience in deriving exceptional power from small units is the background for the development of the AiResearch Turbocharger. This power package was recently applied to Caterpillar diesel machinery with startlingly effective results.

Your inquiries are invited.

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CONTRACTORS AND ENGINEERS

compacted select pit-run gravel, topped by 3 inches of finer cushion-course granular ballast of a ¾-inch-minus material. A 24-foot road-mixed mat, 2 inches thick, and a seal coat will complete the job. The road-mixed pavement and granular base-course work is scheduled to be done shortly, almost two years after work started on the four-mile stretch.

Material handled twice

The first problem on the job was excavating for the big cut. Ten Caterpillar D8 tractors—many of them the special pusher-type units—four Caterpillar and LeTourneau scrapers, and five Caterpillar DW10's started work on the east end of the job.

Meanwhile, Caterpillar tractors moved up to the east cliff of the rock cut to begin pioneering, working in an area with a 300-foot elevation difference in a space of about 700 feet. To complicate matters, a 594-foot × 30-inch 8-gage elliptical corrugated metal pipe with reinforced-concrete inlet and outlet structure, bedded within 10-foot deep × 10-foot-wide × 594-foot-long compacted gravel backfill, had to be installed under the high fill. The excavation for the portion of the gravel backfill below the flowline of the culvert was thoroughly saturated by springs, and a dragline had to be moved in for the job.

But even after the culvert was in, it was impossible to shove the pioneer excavation off the edge of the parapet. This would have caused too much segregation and created voids which fines could sift through, causing the fill to settle too much.

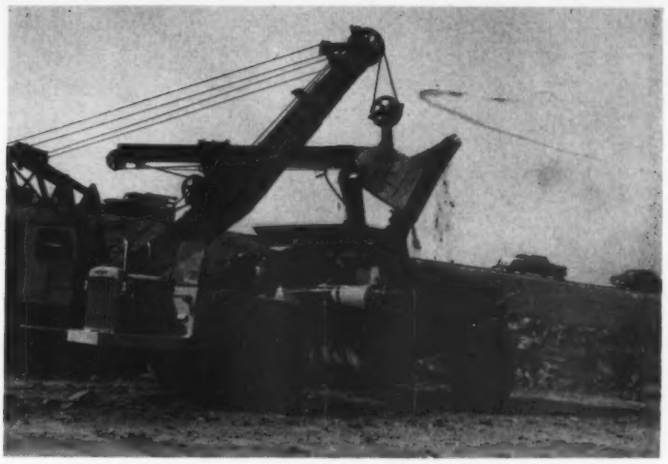
Practically all of this excavation had to be handled twice. Dozers worked on top of the hill, stacking up a pile of material near the edge of the cut. Then, while one dozer shoved the material off, other machines at the toe of the pile spread the excavated material in flat lifts. Scrapers and DW10's, working on this hill later, also had to dump their loads along the edge of the cut and process them in the same way. It was weeks before a ramp could be built to the fill below.

Excavation gets tougher

The scraper and DW10 fleet started working the big cut, taking the 3-foot layer of topsoil out in heaping loads. A formation of sand and gravel just underneath loaded tougher, and rippers had to be brought in to loosen the cementation which began to show up in the gravel. This work continued until the rippers hit a solid rock formation.

Faced with this problem, LaLonde purchased an efficient rock outfit consisting of two heavy Gardner-Denver wagon drills with hydraulic controlled mountings. These are mounted on the front end of a Caterpillar D8 tractor, while a new Gardner-Denver 600-cfm compressor is mounted on the rear of the machine. Working with special drill steel made by Coeur d'Alene

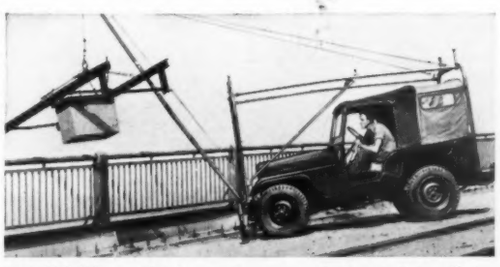
(*Continued on next page*)



In the big rock cut, a Caterpillar DW21 with an Athey PR-21 hydraulically controlled dump body takes a load of material from a Northwest shovel.

Goes anywhere! The Universal 'Jeep' is often the first equipment to reach a construction job, and the last to leave. With the extra traction of its 4-wheel drive, it takes engineers over the roughest ground for first surveys. During construction it carries men and tools wherever they are needed, on or off the road. And when the job is done, it helps speed final inspection work.

How 4-wheel drive 'Jeep' vehicles help contractors save time and money!



'Jeep' with hoist lowers lighting equipment in a bridge deck installation. Because of its light weight, the 'Jeep' can haul materials over new concrete before it is strong enough to support heavy trucks.

'Jeep' Truck with hydraulically-operated back hoe prepares foundations, digs laterals or drainage ditches, and does other jobs too big for hand digging but too small for heavy-duty earth-moving equipment.

Vehicles in the 'Jeep' family help speed work and cut costs in almost every phase of construction.

In 4-wheel drive they go up steep grades—through mud, sand and soft earth—where other vehicles can't go. They shift easily into 2-wheel drive for travel at highway speeds. With power take-off or hydraulic lift, they operate many types of equipment from dozer blades to mobile drills for soil sampling. They stand up to the toughest usage—save you valuable time on job after job. Ask your nearest Willys dealer for an on-the-job demonstration or write for information.

The 'Jeep'®
family of 4-wheel drive vehicles
WILLYS... makers of the world's most useful vehicles
WILLYS MOTORS, INC., TOLEDO 1, OHIO

With topsoil removed from the cut, a Caterpillar ripper loosens shale so that it can be loaded by scrapers.

(*Continued from preceding page*)

Hardware & Foundry Co., Wallace, Idaho, and Ingersoll-Rand Carset bits, this unit regularly accounted for about 1,800 feet of 2-inch-bottom holes per 8-hour shift.

Since most of the hard rock in the cut lies flat, it was easily worked by the drill. A heavier 12 to 14-foot-thick bedded sandstone ledge farther down also lay flat, making drilling easy. Drilling costs, including the cost of bits and steel, were about 10 cents per cubic yard.

Drill holes, put down on a 6-foot-square grid for scrapers and spread farther for shovel excavation, were drilled a maximum of 12 feet deep. Accurate positioning of these holes was possible through the use of the hydraulic jib mounting on the front end of the Cat. Big blocks of up to 1,000 holes were usually drilled at one time by this special rig.

Both wet and dry loading conditions were encountered on the job. In one case, about three tons of granular powder already loaded into a shot was lost completely when heavy rain fell for a day and a half. A considerable amount of seepage from underground springs made loading difficult. Under wet conditions such as this, 40 per cent gelatin dynamite was used. Under dry conditions, Atlas bag powder was poured on top of a stick of gelatin equipped with an exploder. Atlas Rockmaster delay caps up to No. 16 were used extensively to control slope lines and develop as much secondary breakage as possible. The row of loaded holes was hooked in a series and a new Du Pont blasting machine fired the shots up to the capacity of the machine. The explosives ratio so far has been about 0.8 pound of powder per cubic yard blasted.

Haul work

Three new Caterpillar DW21's equipped with the new Athey PR-21 hydraulically controlled dump bodies hauled the heavy material after it had been blasted. These rigs were loaded by a Northwest 80 shovel bought from Kiely Construction Co., Butte, Mont., and a rented Northwest. The Athey bodies, rated at 22½-cubic-yard capacity heaped, took the heavy broken rock from a 2½-yard shovel without being damaged. The short 13-foot turning radius of the rigs made them extremely maneuverable in tight places around the shovel.

Each machine hauled about 20 cubic yards per trip. This short loading was necessary because the ramp leading to the high fill had a 31 per cent grade even when excavation was more than half complete. After making the trip, the DW21's pulled the empty body back up the grade in second gear. The hauling distance between the 12-foot shovel bank and the disposal area on the fill was about 1,000 feet.

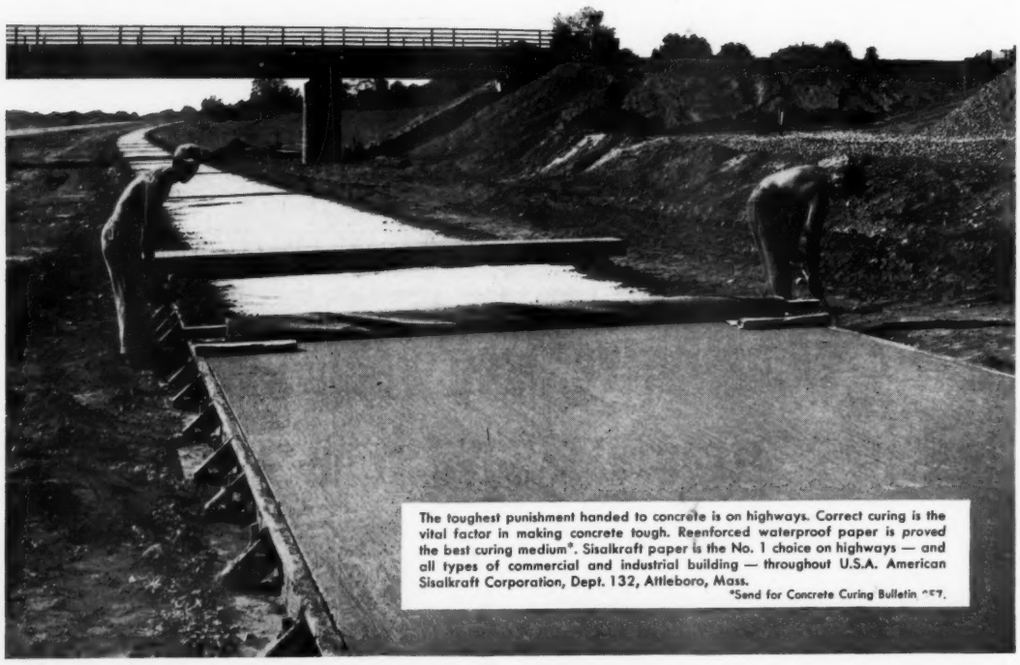
The material, impossible to compact with conventional machinery, was compacted by rubber-tire equipment. After a dozer spread the material in a flat lift usually not more than 2 feet thick, this heavily loaded equipment rode over the fill to develop as much compaction as possible. Fill samples taken in several places showed high densities, ranging between 95 and 100 per cent of the modified AASHO testing method.

Repair work

Though shale streaks in the big cut were dug by power shovels or ripped by rooters, the material caused damage to the mechanical equipment. This in turn created an equipment-upkeep problem for the contractor, for mechanics were never able to keep ahead of their jobs. At best, about 75 per cent of the equipment was kept working at one time. The maintenance work was particularly difficult during the first part of the job, even with extra mechanics.

(*Concluded on next page, col. 3*)

GET TOUGH CONCRETE



The toughest punishment handed to concrete is on highways. Correct curing is the vital factor in making concrete tough. Reenforced waterproof paper is proved the best curing medium*. Sisalkraft paper is the No. 1 choice on highways — and all types of commercial and industrial building — throughout U.S.A. American Sisalkraft Corporation, Dept. 132, Attleboro, Mass.

*Send for Concrete Curing Bulletin 257.

WITH TOUGH SISALKRAFT

Waterproof, Reenforced Paper

Hub-like device for four-wheel-drive vehicles frees front-axle assembly in two-wheel drive

■ A simple hub-like device now on the market automatically free-wheels the front drive assembly of a four-wheel-drive vehicle when it is shifted into two-wheel drive. Installed on each end of the front axle in place of the standard hubs, the Warn selective-drive hub allows the front wheels to rotate freely.

By doing so, the device eliminates a disadvantage of the four-wheel-drive vehicle. A vehicle with power on both axles provides needed four-wheel traction over rough terrain, but with two-wheel drive its front-axle differential gears and drive shaft keep turning even though the front drive assembly is disengaged. The drag created reduces speed, increases gasoline consumption, and wears down tires and gears. The value of the Warn hub is that it makes it possible to use four-wheel-drive without paying this penalty in fuel and maintenance costs, and without sacrificing some of the pep of the vehicle.

The device is available in three types. An automatic model operates with the gear shift to free-wheel the front-axle assembly in the upper gear range. When four-wheel drive is used it automatically engages the front wheels in all forward speeds. This model requires manual locking only in four-wheel reverse.

A semiautomatic version has a manual locking control bar which the driver twists to change from four- to two-wheel drive and back.

For vehicles which are used in four-wheel drive only occasionally, a standard model Warn hub is available. This type is installed in 10 minutes to provide fixed conversion to two-wheel drive.

Warn selective-drive hubs can be used on most four-wheel-drive vehicles, including Willys Jeeps, and Dodge, International, Chevrolet, and GMC (Napco equipped) units.

For further information write to Warn Mfg. Co., P. O. Box 6064, Riverton Branch, Seattle 88, Wash., or use the Request Card at page 18. Circle No. 280.

◄ Warn selective-drive hubs disengage the front-axle assembly of four-wheel-drive vehicles in two-wheel drive.

New air-entraining agent

■ A new air-entraining agent has been announced by Preco Chemical Corp., Garden City Park, N. Y. Entrex, added in properly controlled amounts, is reported to give concrete improved durability; superior resistance to the disintegrating effect of freezing, thawing, and de-icing salts; and increased workability. It is also said to eliminate bleeding, segregation, and honeycombing.

The finished concrete has a finer surface texture, greater plasticity, higher compressive strength, and lower water absorption.

Entrex meets all government and ASTM specifications, according to the manufacturer.

For further information write to the company, or use the Request Card at page 18. Circle No. 248.

(*Continued from preceding page*)

The contractor's central shop and repair setup is on the high flat bank overlooking the big cut. Parts are available on short notice from the Great Falls distributor, Central Machinery Co., which stocks more than 10,000 different spare parts for the lines it handles. This good distributor service, coupled with on-the-job fueling, lubrication, and routine adjustments, has helped mechanics get the contractor's dirt units back into working condition for another job.

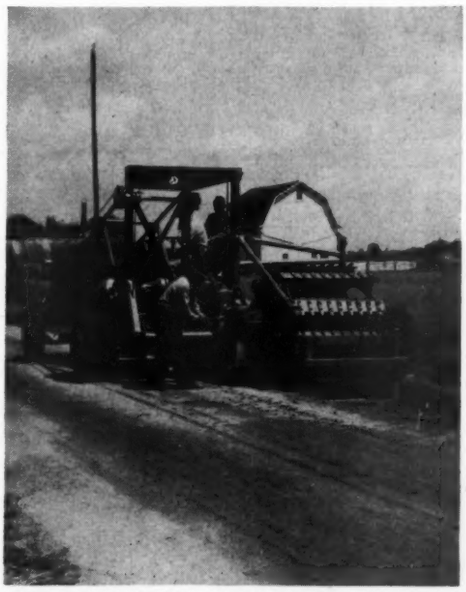
Personnel

Design engineering and supervision of the Belt relocation job is under the general direction of Scott P. Hart, state highway engineer for the Montana State Highway Commission. S. B. Sanders is construction engineer. Field supervision is being done by Don B. De Vore, division construction engineer, with R. L. Wiley as project engineer.

Bert LaLonde, one of the LaLonde Construction partners, is supervising the job part of the time, assisted by Andrew Stolzenberg, general superintendent. THE END

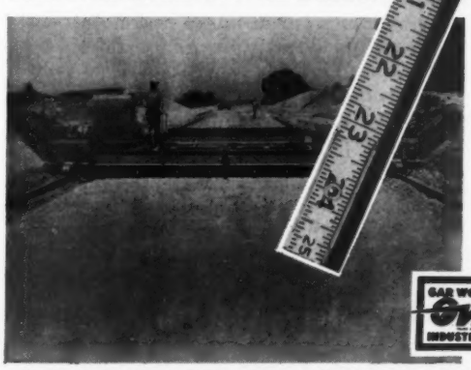
Clark extends leasing operations to Canada

Clark Leasing Corp., a wholly-owned subsidiary of Clark Equipment Co., Buchanan, Mich., will lease Clark's line of Michigan construction machines in Canada on terms similar to those available in the U. S.



HI-WAY WIDENER DIGS CLEAN TRENCH IN ONE PASS

WASTE IS ELIMINATED WITH THE SPREADER



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Eliminate excess labor, save material and time! Spread exactly where wanted—to controlled depths—with clean cut edges—leaving no material to be spread or raked by hand. Flow regulated for either uniform or tapered spread, from a sprinkle to 2½" depth. Width of spread can be narrowed in 6" multiples. Widths: 9', 10' & 12'.

GAR WOOD-BUCKEYE
POWER FINEGRADERS

Your last grade-building step between paving profits and loss! Cut grade exactly to specifications all the way, ready for the paving crew, with NO high or low spots in any soil . . . Eliminate dollars lost in concrete for slab that's too thick; eliminate chance of penalties for slab that's too thin . . . Two models, for widths from 10' to 25'.

GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

No. 5518

A clamshell removes muck from the 31-foot-diameter construction shaft being sunk through overburden to the New Jersey section of the new Lincoln Tunnel tube. *C&E Staff Photos*

Construction shaft is sunk at vehicular tunnel project

New access-way to partly driven Hudson River tube permits work to get under way on ventilation building

Driving operations on the third tube of the Lincoln Tunnel between New York and New Jersey were halted temporarily in April as the tunnel reached the Hudson River shoreline —642 feet from the New Jersey ventilation shaft. A 31-foot-diameter construction shaft was then sunk between the shoreline and the ventilation shaft, providing a second entrance to the tube. Use of this new shaft will drain activity from the ventilation shaft, permitting construction of the $1,123,262 New Jersey ventilation building directly over the first excavation.

When tunnel-driving stopped, about 240 of the 32-inch-wide cast-iron and steel tunnel rings had been installed by the shield-driven method. The new shaft was started by driving interlocking sheet piling through 45 feet of overburden to the top of the tunnel rings. Muck within the sheet piling was removed by a clamshell bucket. When the tube was reached, the top segments of eight rings were removed, allowing the shaft to enter the tunnel.

A hoisting rig installed in the new shaft will permit materials to be delivered directly into the tunnel. All the air and utility lines—previously carried by a temporary 350-foot bridge over the railroad yard and down through the ventilation shaft—will now be routed directly down the new construction shaft.

Work on both the 5,396-foot Hudson River tunnel and a 705-foot sec-

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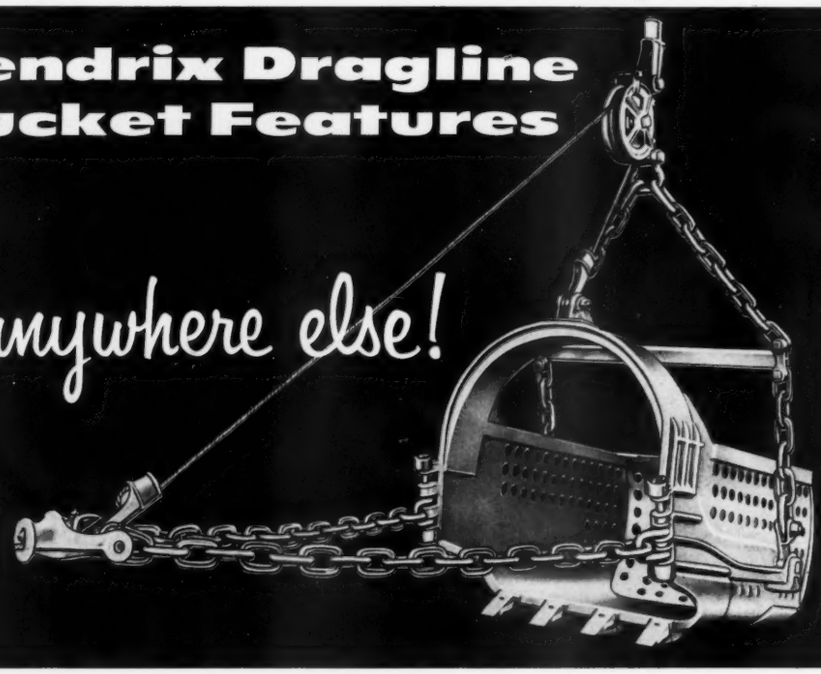

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A Hendrix Dragline Bucket automatically steps up your yardage *for bigger payload profits.* Because of lighter weight, type for type, a larger Hendrix can often be used without overloading the machine. This extra yardage is just one of the dollar-saving, profit-making features of a Hendrix.

Work-Saving Features

Hendrix Dragline Buckets are designed to give maximum performance and built for dependable operation on even the toughest jobs. Perfectly balanced, Hendrix Buckets *handle easier, fill faster* and *dump cleaner*... moving more yardage in less time.

Long-Life Features

Years of know-how and engineering have gone into the manufacture of Hendrix Dragline Buckets. High quality materials and consistent expert workmanship put into the all-welded Hendrix Bucket assure trouble-free, long-life performance day in and day out... job after job.

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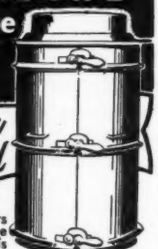

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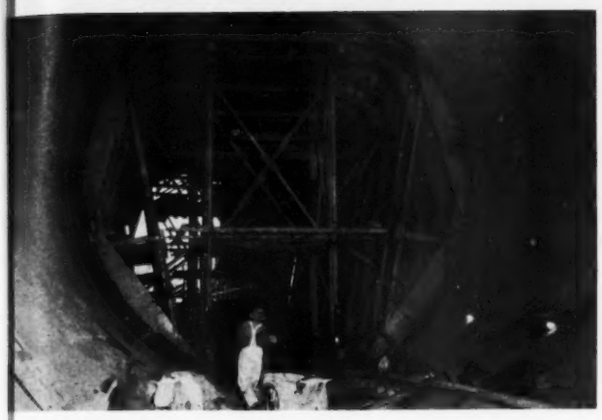


Blaw-Knox forms were used to place concrete in the 705-foot land tunnel on the New Jersey side. Just beyond the scaffolding is a 125-foot section of the tunnel which is being constructed by the open-trench method.

Ahead of the falsework used to secure tunnel-ring sections, the 240-ton driving shield has been sealed with the exception of two hydraulically operated muck doors—preparatory to sinking the new construction shaft.

tion of the tunnel extension was started by the joint-venture firms of Mason & Hanger Co., Inc.; the Arthur A. Johnson Corp.; and MacLean-Grove & Co., Inc., all of New York, N. Y., from the 55-foot-deep ventilation shaft. This shaft, 101 feet long and 61 feet wide, is located 22 feet south of the ventilation building which services the two existing tubes. It is bounded by a vertical rock bluff on the west and south, a railroad yard on the east, and the existing ventilation building on the north.

It was from this shaft that the 240-ton shield driving the tunnel made its initial push last November. Driving began in rock, which was blasted, drawn into the tunnel through the shield, and removed through the ventilation shaft. The cast-iron segments of each ring were thrust into place by a mechanically operated erector arm attached to the rear of the shield framework. The arm pivots to place the section, and the segments and the key are fastened together with high-tensile steel bolts by mechanical tighteners.

Once a ring was installed and more rock removed, the shield was pushed ahead 32 inches by 28 200-ton hydraulic jacks braced against the face of the previously assembled ring. Another ring was then installed by the erector arm, and fastened together, and another forward shove made.

Before the tube emerged from the rock strata, 24 cast-steel rings were used in place of the cast-iron rings. Another 24 cast-steel rings were used in the soft silty material underlying the Hudson River shoreline after the tube had left the rock strata. These cast-steel rings will offset greater stresses on the tube where it leaves rock and enters the riverbed. A total of 70 cast-steel rings will be used on the New York side to obtain rigidity where the tube leaves riverbed material to enter rock.

Compressed-air work

A 10-foot-thick concrete bulkhead inside the cast-iron lining and about 30 feet from the ventilation shaft allows compressed air to be induced into the tunnel. About 15 psi of com-

(*Continued on next page*)

Why 4 Reverse Speeds in a motor grader?

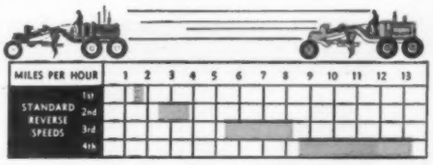
Try an ADAMS and see!

Adams 4 reverse speeds (instead of the usual 2) give you a more flexible speed range for back-up operations—up to 13 mph. This pays big dividends when shuttling back and forth on short stretches, working between forms, etc. Your Adams backs up to starting points quickly, economically—saves production time.

This is only one of the many *plus* advantages that make Adams Motor Graders the most advanced and finest-performing on the market. Others include: 8 Forward Speeds (up to 26 mph.)—Optional Creeper Speeds (low as ¼ mph.)—Easy-Shifting, Constant-Mesh Transmission—Rubber-Mounted Engines—Dual-Braking System.

Adams Motor Graders are available in four popular models, 75 to 140 hp. Ask your nearby Adams dealer to show you the size best adapted to your needs—show you how it can do better work, faster, at lower cost than any grader you've ever owned.

Only ADAMS has 4 Reverse Speeds



Adams 4 reverse speeds range from 1.2 to 13.2 mph.—save you valuable time in shuttling back and forth on short stretches, backing to buck snow drifts, etc.

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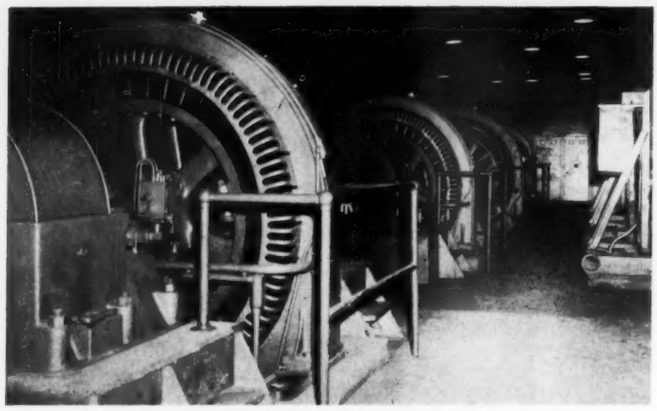

These four Ingersoll-Rand low-pressure stationary compressors, set up in a compressor house in the contractor's yard, supply a total of 22,992 cfm of air to the tunnel.

C&E Staff Photos

(Continued from preceding page)

pressed air above the normal 15 pounds resists external pressure on the tube, prevents river water from entering, and supports the silt ahead of and around the shield. Four Ingersoll-Rand low-pressure air compressors, installed in the contractor's yard adjacent to the new construction shaft, supply a total of 22,992 cfm of compressed air to the tunnel. The compressor house also contains two Aldrich hydraulic pumps for the shield jacks, and two Chicago Pneumatic and three Joy high-pressure air compressors for the air-operated tools on the job.

Approximately 150 sandhogs, working three-hour shifts around the clock, go through a steel air lock to enter the tunnel at the base of the ventilation shaft. The lock, 6½ feet in diameter and 34 feet long, is supported in the concrete bulkhead. Besides the air lock, a muck and materials lock 39 feet long and an emergency lock 20 feet long are also built into the bulkhead. The emergency lock, centered at the top of the bulkhead, is also used by Port of New York Authority engineers to establish survey lines into the tunnel. A reading is taken after every 32-inch thrust to determine the course of the tube. Should tunneling deviate from the course, tapered rings instead of the standard rings will be installed to bring the tunnel back to its normal bearing. Also embedded in the bulkhead are compressed air and hydraulic lines.

Except for two hydraulically operated muck doors which were installed in the shield to allow a controlled amount of silt to enter the tube, the openings of the shield were completely sealed with steel channels before work started on the new construction shaft. With the seal completed, the compressed air was shut off, the concrete bulkhead removed, and work on the construction shaft begun. When the construction shaft is completed, a new concrete bulkhead supporting the air locks will be constructed east of the new work shaft. This bulkhead will be sufficient to maintain pressure until the tube reaches the New York pierhead line, where another bulkhead will be installed.

When compressed air is turned on and the shield resumes its driving operation under the Hudson, as much as 80 per cent of the riverbed silt will be displaced. The remaining 20 per cent will be passed through the shield's hydraulic muck doors and deposited as ballast to offset the buoyancy of the tube. Silt will not have to be removed, as was the case before the shield was sealed. At the middle of the river, the top of the tube will be about 75 feet below mean high tide, or approximately 25 feet below the bed of the river. As silt is displaced by the tunnel, the riverbed may become disturbed, in which case dredging will be required to maintain the channel depth.

An existing New York City pier in the path of the tunnel is now being removed. Since the riverbed material is being disturbed as supporting piles are removed, a clay blanket will be placed over the area. This will prevent air losses in the tunnel on the New York side. As the shield enters rock on the New York shoreline, 70 cast-steel rings will be placed, then cast-iron rings again until the tunnel reaches the 95-foot ventilation shaft already prepared by the Gull Contracting Co., Inc., Flushing, N. Y. Then the tunnel will be sealed, the compressed air turned off, and the deposited muck and silt removed.

Tunnel extension

The other phase of the joint-venture $17,260,000 contract is the boring through rock of a 705-foot land tunnel starting at the west face of the New Jersey ventilation shaft. Under

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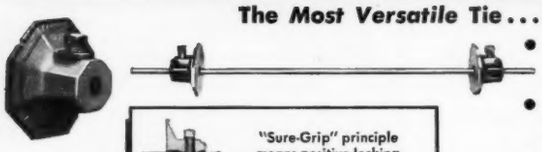

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a separate contract, the Grow Construction Co., Inc., New York City, will construct a final 125-foot section connecting the 705-foot tunnel to the new portal adjacent to the existing Lincoln Tunnel portals in Weehawken. The longer section is a 34-foot-diameter tunnel drilled and blasted through the Palisades rock. Concrete was placed around Blaw-Knox forms to make a cradle for the structural-steel rings which line the land tunnel. These differ from the river tunnel rings in that only ten 5-foot segments plus a key were used per ring. Like the rings for the river tunnel, these were placed by a traveling erector arm. The final 125-foot section will be constructed by the open-cut method. Trenching will be done from ground surface through earth and rock, the tunnel structure installed, and earth backfill placed to original ground level.

Lining and roadways

Before the concrete lining is placed in the river and extension tunnels, all joints between ring segments, as well as between separate rings, will be sealed. The joints in the river tunnel will be cleaned out with compressed air and given a strip lead caulking. The joints in the rock tunnel extensions will be welded to form a watertight seal.

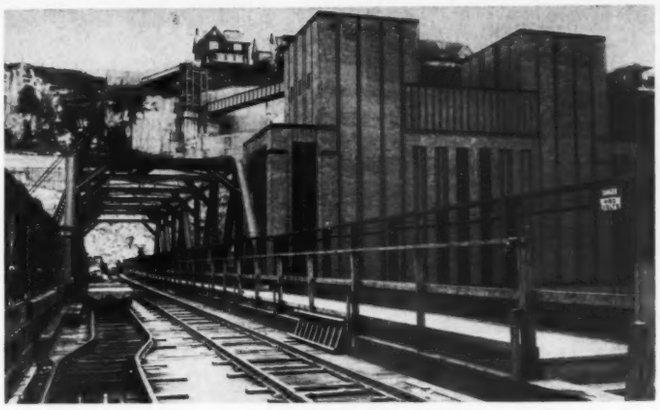
Blaw-Knox movable forms will be used to place a 14-inch inner lining of concrete throughout the length of the tube. A 14-inch-thick roadway slab and a 5-inch roadway ceiling will also be poured throughout the tunnel. The roadway will form a roof for a fresh-air duct, and the roadway ceiling will form the bottom of another duct which will remove exhaust gases from the tunnel. Twenty-four blower and exhaust fans in the New York and New Jersey ventilation buildings will provide a change of air in the third tube every 1½ minutes. The tunnel extension now nearing completion in New Jersey will also have an inner lining of concrete.

When concreting is completed, the walls and ceiling will be lined with 2,600,000 squares of 4¼-inch ceramic tile, a 4-inch pavement will be laid to make the two-lane roadway 18 inches thick, and wiring and utilities will be installed.

Over-all dimensions of the new tube include:

Length of tunnel, portal to portal
8,013 feet
Section of tunnel between two shafts
5,396 feet
External diameter
31 feet
Width of roadway
21 feet, 6 inches
Operating headroom
13 feet
Maximum depth from mean high water to roadway
97 feet

John M. Kyle is chief engineer for The Port of New York Authority, and Paul E. Blume is project engineer. H. George Decancq is over-all engineer on construction, and Harry A. Druding is resident engineer for the third tube in New Jersey. The project manager for Mason-Johnson-MacLean is Mansel MacLean. THE END



This 350-foot bridge used to carry men and materials over a railroad yard will no longer be needed when the new shaft is completed. To the right of the bridge is the existing ventilation building for the two tubes now in use.

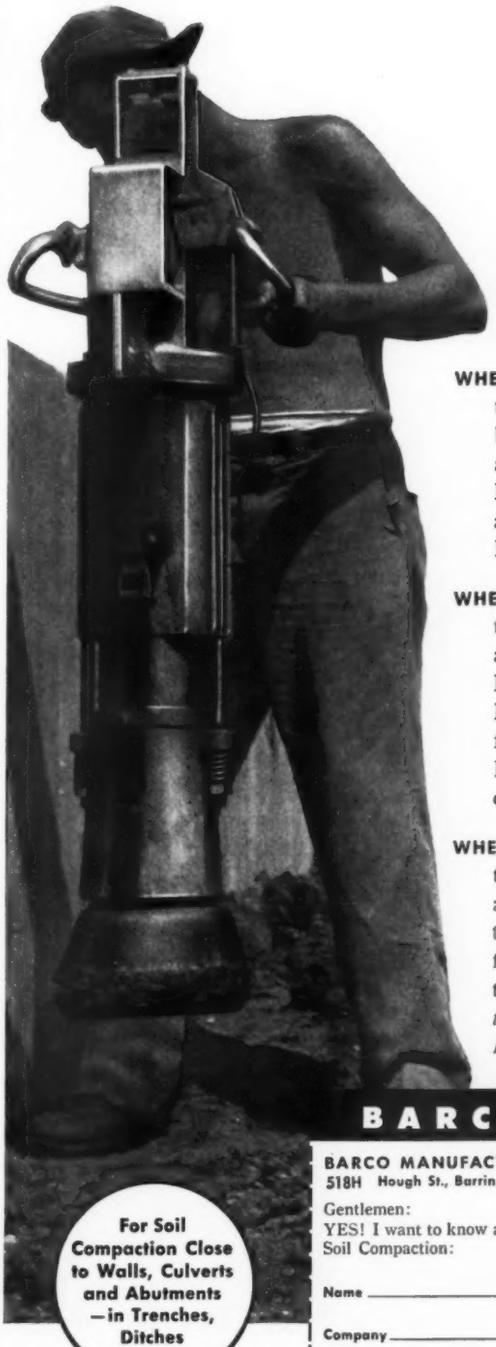
Manual on rock drilling

A comprehensive drilling manual, "Drillers Handbook on Rock", has been released by the Davey Compressor Co., Kent, Ohio. The 58-page booklet discusses in detail the hardness, texture, fracture, and formation of rocks. Methods for judging the speed with which rocks can be drilled are also included.

The handbook contains 71 illustrations and 15 charts. A glossary of technical terms and illustrations of modern drilling equipment round out the booklet.

Priced at $1.50, "Drillers Handbook on Rock" may be ordered through the Rock Drill Division of the company.

WHEN CONSTRUCTION JOBS CALL FOR SOIL COMPACTION



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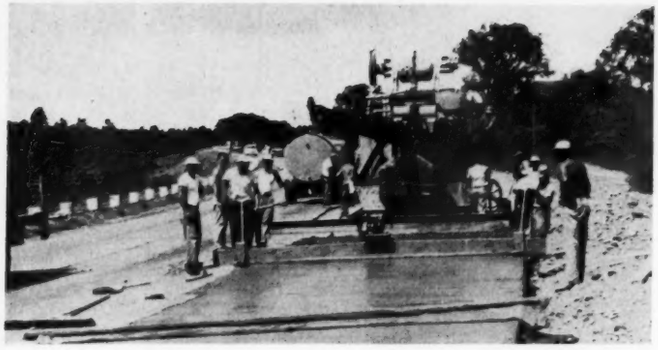

A Stow vibrating screed was determined upon as the most economical machine for finishing a 14-foot-wide concrete lane laid on both slopes of a long hill.

Vibrating screed found most efficient for small paving job

To finish concrete economically on a job too small for a self-propelled road-finishing machine and too large for manual screeding with a 2×4, the Pasquale Construction Co., Endicott, N. Y., used a Stow vibrating screed. The unit's Power-Pak assembly, which includes a 2-hp Briggs & Stratton engine and a vibrating head, makes this screed a fast finisher that leaves a smooth surface.

The job consisted of putting a third lane, 14 feet wide, on both slopes of a rather long hill near Chenango Forks, N. Y. Since it is designed to be portable, the Stow screed was moved easily to and from the job.

A large self-propelled mixer moved along ahead of the screed, with the screed pulled up the hill by only two men. The concrete used had a minimum slump of 2 inches. Any rough spots left after the screed passed were touched up with hand trowels, after which a stiff broom was pulled across the width of the slab—roughing the surface slightly to provide better traction.

Portable materials hoist

■ A two-wheel-mounted automatic materials hoist that is towed to the job as a unit is shown in a folder from Tusky Corp., 666 Mission St., San Francisco 5, Calif. The Tusky hoist can be erected by one man in about 2½ minutes and is counterbalanced to tilt up easily to a vertical position.

A hydraulic winch, with no clutch or down brake, provides the hoist with automatic control. The platform can be started or stopped from either side, at the top or bottom, or even from the platform, by one of two control wires running the length of each side of the hoist. Adjustables stops, preset on the control wire at the desired upper and lower levels, automatically halt the platform at the proper height.

The Tusky hoist has been designed to handle two wheelbarrows or 1,200 pounds. Hoisting speed is adjustable, with about 100 feet per minute recommended. The hoist is free-standing at a 24-foot height permitting materials to be unloaded at heights up to 21 feet. The hoist can also be used to unload materials at heights over 100 feet by the addition of extensions.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 310.

Tractioneer Trac-Plates improve traction over loose earth or mud.

Traction-plate assembly for dual-tire trucks

■ A new traction assembly for dual-tire trucks consists of easily-applied spring-steel plates which flex with the tires to provide vibrationless operation at normal speeds. Made by Tractioneer Co., 410 N. Michigan Ave., Chicago 11, Ill., the traction plates are designed for use on sand, gravel, loose soil, or snow and ice. Included as standard equipment are center lugs which give added traction in deep snow or mud.

The Trac-Plates are secured to the truck's dual tires through a special

spacer which replaces the ordinary spacer on spoke hubs between dual wheel mountings. Bolts are tightened to draw the cleated plates down into

Allis-Chalmers presents the new

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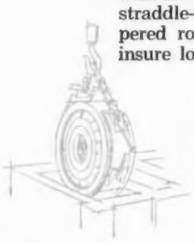
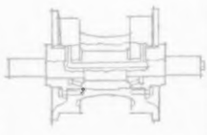
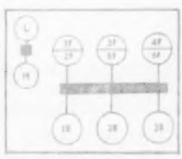


Unit Construction lets you remove engine, master clutch, transmission, steering clutches and final drives without disturbing adjacent parts.



1,000-Hour Lubrication Intervals for roller bearing truck wheels, idlers and support rollers . . . makes production time out of service time.

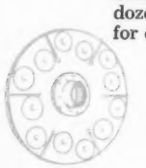


Dual-Range Constant-Mesh Transmission lets you go from any forward speed to any reverse speed by shifting only one lever. Eliminates double shifting! That means faster work cycles . . . more production!

plus . . . these great new feature

New Allis-Chalmers Diesel Engi with "follow-through" combustion a tornado turbulence . . . for smooth eng performance, cleaner combustion, ex long engine life.

New Wrap-Around Radiator Guard used as dozer lift frame to simplify design, reduce cost of bulldozer; guard tilts forward for easy service.



New Master Clutch with Ceramic Lining sets new standards of clutch life . . . with fewer adjustments required.

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PLUS . . . new, all-weather cooling; independ radiator-core mounting; new strength and pacity in final drive gears, shafts and beari

NEW STANDARDS OF PERFORMANCE AND LONG LIFE ON A WIDE RANGE OF JOBS

You owe it to yourself to inve gate the performance advanta of the HD-11 . . . newest addi to the Allis-Chalmers leader line. See your nearby Al Chalmers dealer now.

a locked position. An adapter is available for Budd or disk wheels.

The number of Trac-Plates used may be varied since they are individually applied.

For further information write to the company, or use the Request Card at page 18. Circle No. 227.

Turner appoints Lutz director of research

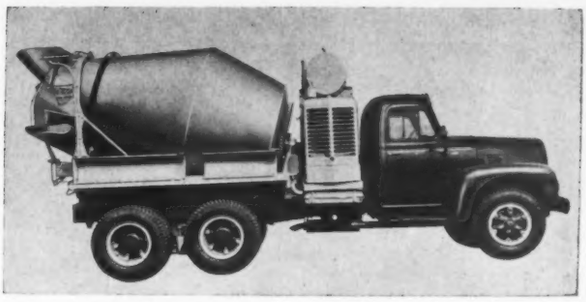
The Turner Construction Co., New York, N. Y., has appointed Godfrey Lutz director of construction research. A graduate of the Swiss Federal Institute of Technology, Zurich, Mr. Lutz has worked on difficult building structures throughout the world. He has been with the Turner organization since 1933.

Truck mixers feature improved chute design

■ A chute arrangement that gives more flexibility during pouring and makes chutes easier to handle and wash is one of the outstanding feature of Construction Machinery Co.'s new Transcrete truck mixers. The units are available in 3½ to 6-yard capacities.

Extra chute sections are racked on edge and locked in place with spring latches to provide more road clearance. A hydraulic spout lift is available as optional equipment.

Another feature of the truck mixers is their improved charging hopper control. A flip of a lever locks the hopper in for charging or out for discharging.



An easier-to-handle chute is one of several improvements on the new CMC Transcrete truck mixers.

Other improvements include Transcrete's Floating Drive with simple chain take-up adjustment, larger drum diameter, deep L-section blades, and a progressively increasing blade slope. This design tends to give more thorough mixing, better discharge, and a greater ability to handle stiff low-slump mixes.

Conveniently grouped rear-end controls are provided for remote operation from the ground or catwalk.

For further information write to Construction Machinery Co., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 234.

Cost analysis available for automatic welding

■ A production-cost study of automatic electric arc welding of seams of cylindrical and elliptical vessels or pipe is available from the Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis 10, Mo. The bulletin covers the welding of 10-gage to ¾-inch plate.

Eighteen factors affecting the cost of welding footage are presented in column form to give unit cost. An accompanying graph depicts unit production and cost per day.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 214.

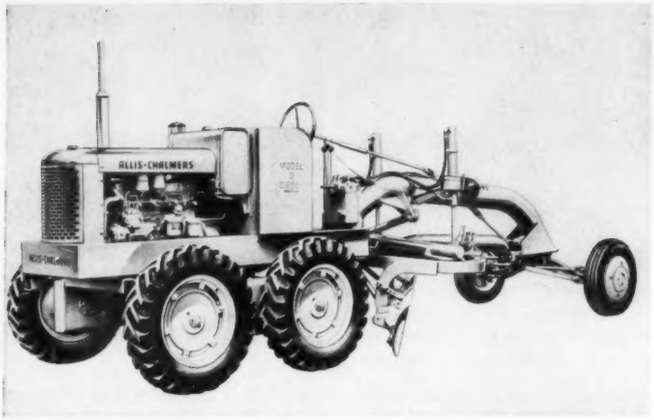
New push plate for motor graders

■ A new push plate for Caterpillar diesel motor graders has been developed by Ulrich Products Corp., Roanoke, Ill. The plate mounts on the head casting of the No. 12 or No. 112 motor grader, increasing the machine's value for push-loading scrapers or for emergency pushing.

Of heavy steel plate, the Ulrich P-12 push plate is reinforced with box web reinforcing. A welded-steel rim keeps push blocks centered on the plate's face.

For further information write to the company, or use the Request Card at page 18. Circle No. 264.

This new Ulrich push plate has been designed for Caterpillar No. 12 and 112 motor graders.



The new Allis-Chalmers Model D diesel motor grader is powered by a 6-cylinder diesel engine rated at 50 maximum brake horsepower.

New diesel-powered motor grader

■ A diesel-powered version of the Model D motor grader has been announced by Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee 1, Wis. A new Allis-Chalmers 6-cylinder valve-in-head diesel engine rated at 50 maximum brake horsepower at 1625 rpm powers the new earthmover. The standard Model D motor grader with gasoline engine will continue in the line.

The new diesel engine has a 3 7/16-inch bore, 4⅛-inch stroke, and 230-cubic-inch piston displacement. Direct electric starting on diesel fuel is provided by a 12-volt starting system.

Features include replaceable wet-type cylinder liners, by-pass cooling system with high-capacity water pump, pressure lubrication, aluminum alloy pistons, simple, easily serviced fuel-injection system, and four filters to assure clean fuel.

Weight of the Model D diesel motor grader is 9,350 pounds with 2,760 pounds on the front wheels, and 6,590 pounds on the rear wheels. Blade pressure is 4,900 pounds. Speeds with 7.50×20 tires range from 2.6 mph in first gear to 25.2 mph in fourth gear.

Basic design features of the Model D such as "Roll-Away" moldboard, single-member tubular frame, tandem drive, compact and rugged gearing, heavy drawbar, and one-piece circle are included in this diesel-powered grader.

Special equipment includes 135-degree power-circle turn, leaning front wheels with a 25-degree range each way, power-shift moldboard, mid-mounted scarifier, 12-foot moldboard, 10-foot moldboard with end bits, 2-foot extensions, cab, snowplow, windrow eliminator, shoulder maintainer, and rear-end loader.

For further information write to the company, or use the Request Card at page 18. Circle No. 315.

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In these times of mounting production costs, many purchasers of industrial supplies and materials are beginning to look upon their distributors as an extra expense. At first blush, it might *seem* cheaper to buy direct from the maker.

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He saves the manufacturer the cost of heavy inventory maintenance in all parts of the country, the expense of an army of salesmen, a fleet of trains and trucks, and a staff of credit and collection experts. In a sense, your distributor represents a cooperative distribution facility that you share with all other firms in your area.

Next time you're tempted to get a direct quotation from the manufacturer, whether on a big or small item, figure out *all* the costs—not just the first cost—and you'll find you gain much more, yet in the long run pay no more, by utilizing the services of your distributor.

WICKWIRE ROPE

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A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

Imported grapple features independent tine action

■ An imported grapple bucket is illustrated in a leaflet from Ruhr Industries, 1411 Walnut St., Philadelphia 2, Pa. The Scheidt grapple features a "floating action" in its tine and arm design that allows it to surround and pick up irregular-shaped solids, such as embedded rock or slabs found in excavation work. Even when meeting such obstructions, the grapple's "floating" construction permits it to continue to collect a load of additional earth or rubble.

The Scheidt grapple is illustrated handling structural steel and digging deep into broken limestone, gravel, pig iron, and scrap. It is made in four types for rock and general materials handling, caisson digging, pulpwood handling, and pneumatic mine-shaft mucking. Eleven sizes are available ranging from 0.4 to 3.3 cubic yards. The grapple is offered in three blade widths: narrow, medium wide, and fully enclosed.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 271.

Campbell named engineer for Pennsylvania district

A former senior inspector and district construction engineer for the Pennsylvania Department of Highways, Raymond F. Campbell, has been appointed engineer in charge of District 10 for the department. The district comprises Armstrong, Butler, Clarion, Indiana, and Jefferson counties. Mr. Campbell will maintain headquarters in Indiana, Pa.

Synthetic rubber product improves asphalt paving

■ Rubarite, a recently-developed synthetic rubber product for rubberized asphalt paving is now distributed by Borne, Scrymser Co., Elizabeth, N. J. The product is made by the co-precipitation of synthetic rubber latex and small particles of barytes mineral. Asphalt paving to which it is added has more ductility at low temperatures and a higher softening point. It also gains in impact resistance—particularly at low temperatures—as well as in elasticity, viscosity, and pour point, and in penetration at low temperatures.

Used as a crack and joint filler, Rubarite can be poured at temperatures between 250 and 350 degrees F. In this application it is said to offer greater adhesion and lower susceptibility to temperature changes than conventional fillers.

It can also be used as a rubberized adhesive for traffic markers, and for making rubberized membranes and waterproofing for bridges, culverts, and other damp or wet places.

The use of Rubarite does not require any special equipment, and the finished mixture can be handled in exactly the same manner as conventional hot mixtures.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 299.

Wheeler sound-powered telephones operate without batteries or other auxiliary power.

Sound-powered telephones suitable for field use

■ Voice-powered telephones that require no batteries or outside power source are made by Wheeler Insulated Wire Co., Inc., Waterbury 20, Conn. Quickly installed, these telephones provide instant two-way communication for distances up to 25 miles.

With handsets and housings of high-impact plastic, this equipment is recommended for regular field application and for emergency use. Up to 12 handsets can be incorporated into a single system providing contact between widely scattered points.

The sound transmitted is reported to be clear and undistorted, with none of the "frying" and other transmission noises sometimes experienced with intercom systems. The ringing signal is similar in tone and audibility to a standard telephone bell.

All operating metal parts are of chrome nickel, stainless steel, Monel, Inconel, Eraydo, or other corrosion-resistant materials. Alnico permanent magnets are used in the telephone units, ringers, and generators. Coils are impregnated for maximum resistance to moisture.

For further information write to the company, or use the Request Card at page 18. Circle No. 270.

Booklet on varied line of tractor attachments

■ A new booklet outlines methods of increasing productivity through the use of Hyster job attachments on new or used tractors. Prepared from on-the-job case histories, the literature gives information on the use of tractor tools for profitable fill compacting, trenching, shoveling, pile-driving, winching, yarding, bituminous salvage, and other construction work.

Over 30 different attachments are illustrated, including the Hystaway excavator-crane and Hyster grid rollers, donkeys, yarders, and winches.

To obtain Form No. 1305 write to Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 207.

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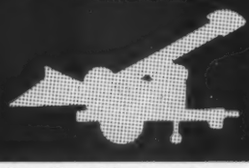

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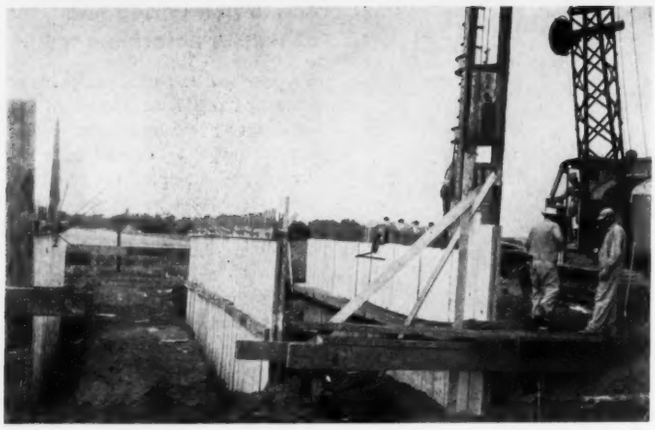


Using a 2,000-pound drop hammer, a crane drives the 14-foot-long piles to bearing. Plywood shims with holes drilled to contain the projecting reinforcing rods are built on top of the piling so that the piles can be driven without damaging the reinforcing. *C&E Staff Photo*

Concrete sheet piling forms box culvert walls

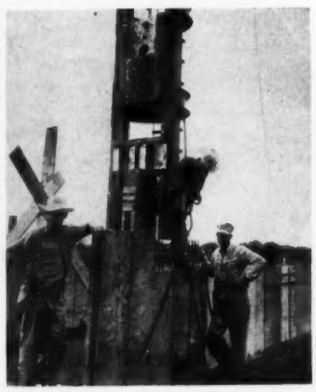
Precast concrete sheet piles were driven with a drop hammer to form walls and provide bearing for a double-barrel box culvert on a Nebraska highway contract. Christensen Corp., Fremont, Nebr., was the general contractor on the job, which also included seven bridges on State Route 89 east of Wilsonville. The sheet piles were cast at the yard of the Wilson Concrete Co., Inc., Grand Island, Nebr.

Each pile, 6×16 inches in cross section, had a tongue on one side and a groove on the other, permitting the piles to fit snugly together. Sections for this culvert were cast 14 feet long. They were reinforced with from four to six longitudinal bars, each ¾ inch in diameter, which projected 18 inches above the top of the pile. The bottom end was pointed to facilitate driving.

Forms for casting the piles six at a time were made of 16×3-inch steel channel bottoms and wooden sides. Concrete was mixed in a CMC 11-S Wonder mixer and brought to the forms in an Insley ½-yard bucket handled by a stiffleg derrick. This equipment was normally used in the manufacture of reinforced-concrete pipe in the same yard. After being cured with burlap and water, the piles were trucked to the culvert site.

To drive these piles with the rods projecting from the top, it was necessary to build up shims which would protect the rods while permitting the hammer to operate. Christensen used a series of plywood shims cut to the size of the cross section of the piles and drilled to receive the reinforcing rods. A 16-inch piece of 6×8 timber, similarly drilled, topped out the shims and supported the follower. The piles were driven by a 2,000-pound drop hammer handled in shop-made leads by a Northwest 25 crane. Timber wales were bolted to each side of the piles, keeping them in alignment during driving and until the concrete deck of the culvert had been formed and placed.

When the three rows of piles forming the center and outer walls of the double-barrel culvert had been driven, the projecting reinforcing rods were bent down and a 9-inch concrete slab was placed over the top. Although bridge roadways on this job are just 22 feet wide, the culvert was made 31 feet long and approximately a foot of the roadway base material was placed over the top. THE END



Fitted together by tongue-and-groove sides, precast concrete piles are held in alignment by timber wales along both sides as they are driven to provide walls for a double-barrel high box culvert.

Model C-250
25 H.P. Optional Self-Propelled.
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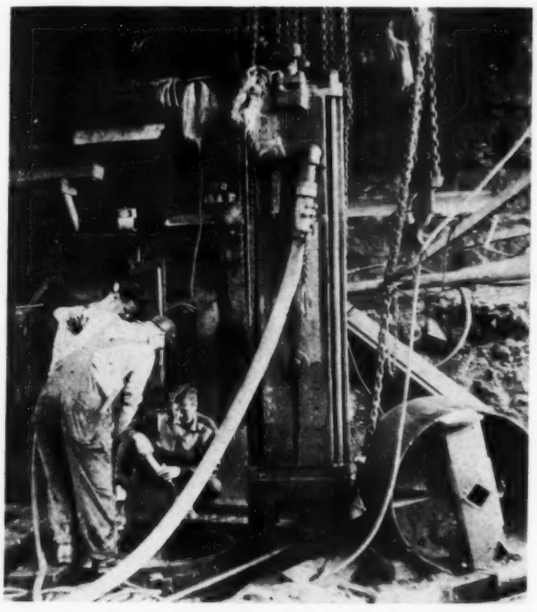
Caissons for the new pier shafts are made up of 48-inch-diameter x ½-inch-thick steel cylinders in 5 to 8-foot sections, welded together as they are driven.

Sheeting driven along the left side of the timber work trestle and pumping keep the job site fairly dry. A Manitowoc crane with clamshell drops excavated material into holes cut through the trestle to back up the sheeting.



Men get ready to drive another section with a McKiernan-Terry 10-B-3 hammer. Because of the limited headroom, the hammer is hung from a beam suspended from the bridge girders.

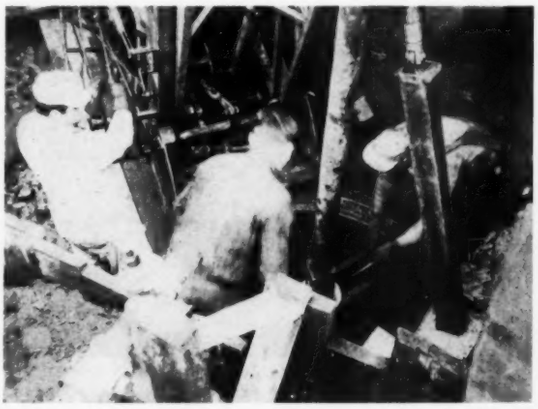
Compact drill rig speeds work on new rail viaduct

Deck slab on 48-inch-diameter concrete and steel shafts will replace old structure; traffic is uninterrupted

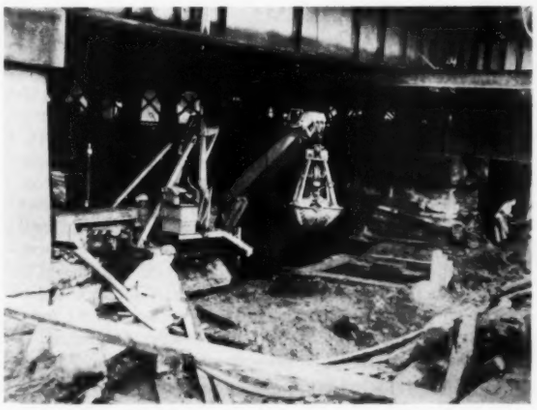
by ANTHONY N. MAVROUDIS, field editor

A 740-foot stretch of viaduct on the New Haven Railroad, just west of the station in Bridgeport, Conn., is being rebuilt without interfering with heavy rail traffic.

The existing viaduct, consisting of old stone piers and steel girders supporting the tracks, is being replaced by 48-inch-diameter × ½-inch-thick circular steel and concrete shafts

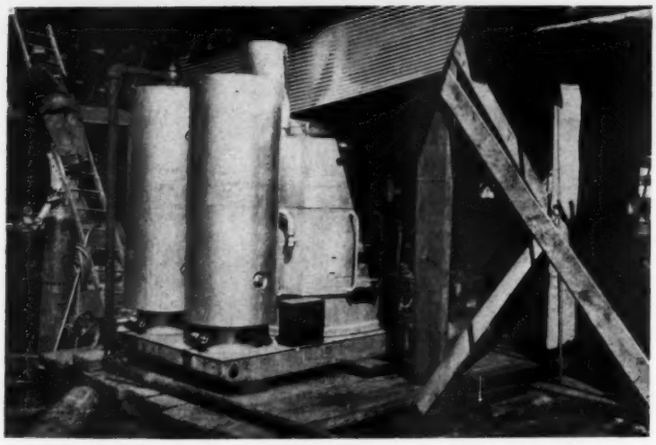


Drilling through rock 60 feet down with a 47-inch-diameter chopping bucket attached to the drill stem. The bucket is dropped and rotated by a Calweld drill rig.



Cleaning out inside the caisson with a Hayward orange-peel bucket lowered from a boom on a Caterpillar D6 tractor. Dirt, rock, timber, and miscellaneous debris are excavated.

A three-man crew operates the Calweld Model 200 A dry rotary bucket-type drill. The compact rig, powered by a gas engine at the rear end, works efficiently in the tight quarters beneath the existing trestle. The job is being done by the Foundation Co., New York, N. Y.



A Littleford 135-hp steam generator supplies steam to the hammer driving the caissons for the new pier shafts.

on which will rest a 30-inch concrete deck slab to support the roadbed. There will be no change in either the horizontal or vertical alignment of the existing tracks carried on the trestle.

A concrete slab and gravel fill arrangement was chosen because of its low-maintenance appeal. The Foundation Co., New York, N. Y., is doing the job. Work on the project got under way in December, 1954, and is scheduled for completion in the summer of 1956. The estimated cost of the project is $2 million.

The existing trestle, skirting the shoreline along an arm of Long Island Sound, is about ten feet above harbor side. The new circular shafts are being sunk through overburden, 22 to 85 feet in depth, and are founded on an underlying stratum of bedrock. To drill through the overburden—mostly sand—the contractor is using a Calweld drill rig. This rig also drills a 48-inch-diameter × 6-inch-deep hole in the rock as a seat for the new foundation shafts. These steel and iron shafts are later filled with reinforced concrete.

Work trestle

Since the railroad runs close to the water, the contractor built a timber work trestle along the water side of the railroad to support a crane used in excavation. Timber sheeting was driven between the railroad and the work trestle to keep the site as dry as possible. Since all work now being done is below water level, several pumps are used to remove excess seepage. No work, of course, can be done from the top of the railroad trestle because of the necessity of maintaining through rail traffic.

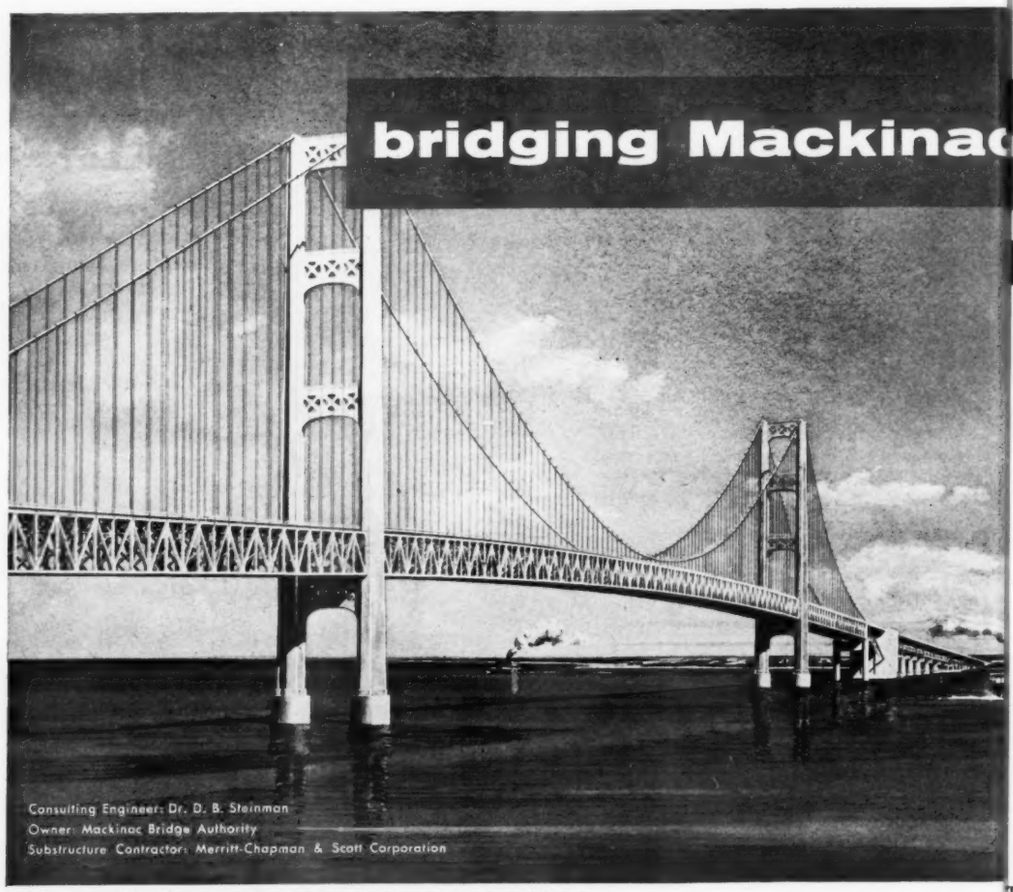
Between the existing piers, which are about 40 feet apart, the top layer of earth is first dozed toward the timber work trestle. From this work trestle a Manitowoc crane removes the waste in a clamshell bucket. Openings in the work trestle permit the crane to dump excavated material under the trestle and against the sheeting.

After a Caterpillar D6 dozer and the crane have excavated to the desired grade between two piers, they are moved to a point between the next two piers. Due to the limited headroom beneath the bridge girders—approximately 15 feet to excavated grade—the small compact Calweld drill rig is being employed to good advantage. It drills easily through the overburden and into the rock beneath. Slots are cut in the bedrock after the shafts are sunk in two rows between the existing piers, parallel to the piers. Each row will have from three to five shafts for a total of 117 shafts on the project.

A McKiernan-Terry 10-B-3 steam hammer, hung from the bridge girders, drives the shafts which are made up of 5 to 8-foot sections. Steam for the hammers, at a pressure of 125 pounds, is provided by a Littleford 135-hp steam generator. After one section is driven, additional sections are welded on and driving is resumed. A Caterpillar D6 tractor, with a boom and Hayward orange-peel bucket, excavates the interior of the caissons, removing rock, timber, dirt, and debris.

Seated in rock

When the shaft is completed, and seated in the 6-inch slot cut in the rock, plain concrete is placed to form a bottom seal. Certain cylinders require greater anchorage than that provided by the 6-inch seating. For these, a 30-inch-diameter core is taken from the rock to 3 feet additional depth, or as ordered. In this a 14-inch H-pile 6 feet long is set, surrounded by a cage of reinforc-


bridging Mackinac
Consulting Engineers: Dr. D. B. Steinman
Owner: Mackinac Bridge Authority
Substructure Contractor: Merritt-Chapman & Scott Corporation

Designer's rendering of Mackinac Bridge, St. Ignace, Michigan. Total length: 26,444 feet.

A great new link in our national highway system, the Mackinac Bridge, will soon span the Straits of Mackinac and connect the two peninsulas of Michigan. Scheduled for completion late in 1957, this suspension bridge—the world's longest from anchorage to anchorage—will rest entirely on Prepakt Concrete. Some 440,000 cubic yards are being placed for the 34 foundation piers.

Prepakt was selected for this five-mile project because of its greater—

Economy. Savings result from the use of a smaller, more economical plant which need mix only the Intrusion Mortar. Coarse aggregate, over 60% of the total concrete volume, is placed directly into cofferdams by self-unloading boats. For the same reason, supply problems are simplified and placement can continue uninterrupted during rough weather. Finally, Prepakt Concrete with less cement content is of better quality than tremied concrete.

Speed. Rapid concrete placement by Prepakt's method has produced these new records for underwater placement from a single floating plant: 8-hr. shift—2,240 cu. yds.; 24-hr. day—6,250 cu. yds.; 5-day week—20,560 cu. yds.; 8-day period—28,320 cu. yds.; 30-day period—102,000 cu. yds.

Flexibility. Prepakt Concrete does not require a continuous pour—placement can be halted and restarted on short notice at little added expense and with no sacrifice in quality. This proved a vital advantage during late 1954 when storms suspended operations repeatedly.

Mackinac Bridge will soon stand as another example of the multiple advantages of Prepakt methods and materials for all types of concrete structures. This $100-million bridge, believed for many years to be impractical if not impossible, is a tribute to its advanced design and the use of modern construction methods. A brochure describing the building of the Mackinac Bridge in greater detail is available upon request.

[*Intrusion* and *Prepakt* are trademarks of Intrusion-Prepakt, Inc. Intrusion-Prepakt methods and materials are covered by U.S. Pat. 2313110, 2655004, 2434302 and others, also patents pending.]

ing bars, before the concrete is placed. Meanwhile, seepage occuring throughout the drilling and driving operations has filled the shaft with water, so that unwatering is required after the seal is placed.

The portion of the shaft below low water is made of steel segments, while wrought-iron sections are used above low water to check corrosion.

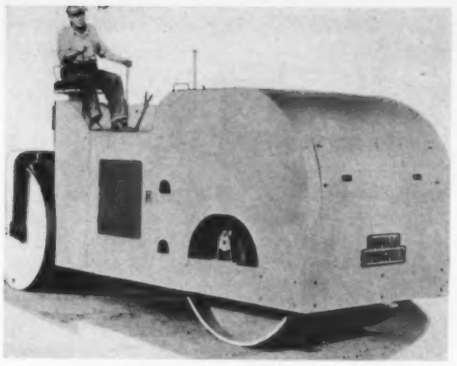
Reinforcing steel, up to 1¼-inch rods, is placed in the dry cylinders, which are then filled with concrete. A reinforced-concrete beam will cap each row of shafts and will support the 2½-foot reinforced-concrete slab. The slab will be approximately 740 feet long, 80 to 90 feet wide, and continuous in construction. Since the upper portions of the existing piers are in the way of the long slab, they will be cut at the proper time.

As the top of the slab will be only 9 inches below the existing steel girders, the sides of the concrete forms will be left open to allow placing of reinforcing steel. After the reinforcing is placed and the forms closed, concrete will be placed by means of the Pumpcrete method. When the slab is cured, gravel fill and stone ballast will be laid to a level where the railroad ties are supported. The existing steel will then be burned away.

Personnel

J. J. O'Loughlin is the superintendent for the Foundation Co., and E. N. Chapin is the resident engineer for the New Haven Railroad.

THE END



The new Buffalo-Springfield Series KT-15A standard tandem rollers are equipped with torque-converter drives.

New 2-axle tandem rollers round out compactor line

■ Three new two-axle tandem rollers have been announced by the Buffalo-Springfield Roller Co., Springfield, Ohio. The KT-15A series standard tandems are in the 5 to 8, 6 to 9, and 8 to 10-ton classes. They supplement both the heavy-duty line of Buffalo-Springfield compaction equipment, and the 8 to 12 and 10 to 14-ton Series KT-19A standard tandems introduced earlier this year. (See C&E, June, 1955, pg. 67.)

One of the important features of these new machines is a single-stage torque converter which automatically matches power and speed to variations in material and grade. The torque converter prevents engine lugging during heavy starts or sudden load increases, permitting engine operation within governed rpm at peak power. Steady constant rolling is maintained at any selected speed from 1 to 5 mph. Furthermore, shock-loads and torsional variations are absorbed in the torque converter.

Like other rollers in this line, the new units have Buffalo-Springfield's exclusive bevel-gear final drive. Another feature is a yoke and kingpin assembly that uses adjustable tapered roller bearings for reduced wear and quicker turning response.

For further information write to the company, or use the Request Card at page 18. Circle No. 233.

Asphalt plant producer describes facilities

■ A new booklet shows the facilities of McCarter Iron Works, Inc., Norristown, Pa., manufacturer of asphalt plants, dryers, mixers, and asphalt buckets. The company designs and manufactures its own equipment, offering standardized parts at minimum cost.

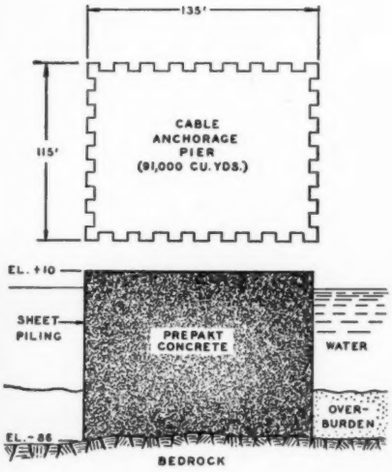
The McCarter line includes plants of 2,000 to 6,000-pound mixer capacities. The company also offers a completely new line of portable and semi-portable plants rated at 1½, 2, and 3 tons. Among other products are aggregate hoppers, bins, apron-type feeders, cyclone collectors, elevators, and steel structures.

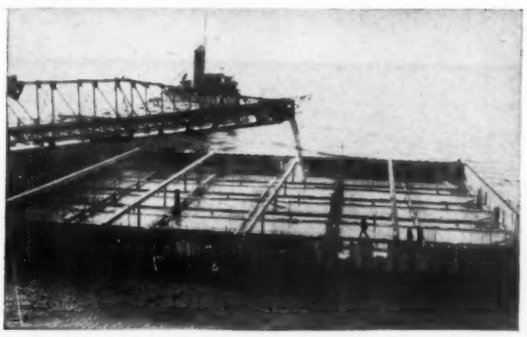
The concern also specializes in repairing and modernizing old plants.

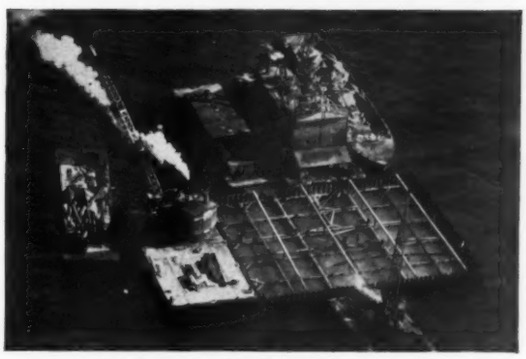
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 220.

aon Prepakt Concrete

Prepakt method cuts cost of piers, sets new concrete placement records







(Top) Unloading stone directly into cofferdam for massive cable anchorage pier. (Bottom) During concreting operations, Prepakt Floating Plant is tended by cement-Alfesil barge (left) and sand barge (right).

The 66,500-ton bridge superstructure is supported by 34 piers, some extending to more than 200 feet below the water surface. Concrete for these piers, made by Prepakt method of consolidating preplaced aggregate with Intrusion Mortar, was placed by the substructure contractor, Merritt-Chapman & Scott Corporation.

Almost all piers used cofferdams of interlocking sheet piling driven to bedrock. After removal of overburden, aggregate was then deposited into cofferdams from 10,000 to 15,000 ton self-unloading boats at rates up to 2,500 tons per hour. Final step was to consolidate stone with Intrusion Mortar which was batched, mixed and pumped from a Prepakt Floating Plant.

Use of the Prepakt technique introduced economies and kept the project on schedule despite the worst construction weather in many years.

Prepakt maintains a complete field construction organization plus an engineering service and functions as prime or subcontractor. For further information, write: The Prepakt Concrete Co., Room 779-Y, Union Commerce Building, Cleveland.

CONTRACTORS PREPAKT ENGINEERS

THE PREPAKT CONCRETE CO.
DIVISION OF INTRUSION-PREPAKT, INC.

MAIN OFFICE: CLEVELAND 14, OHIO
CANADIAN OFFICE: TORONTO, ONTARIO

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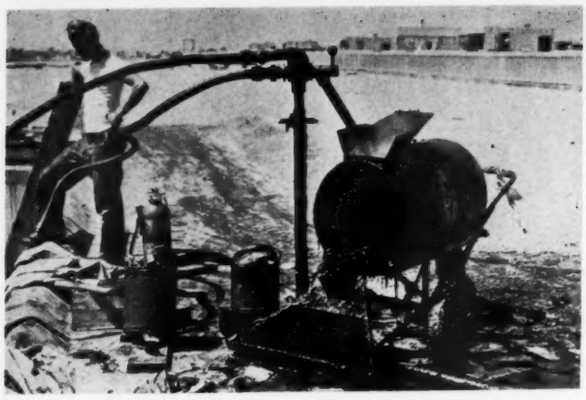


Petrolastic hot asphalt, delivered to the site in insulated tank trucks, is pumped to the roof of this new Ford Motor Co. plant in Milpitas, Calif., from 350-gallon heating kettles. The shop-made spreader being filled with the material puts down the asphalt through the fan-shaped apron in front.

ALTHOUGH the Lincwelder 100 is manufactured primarily for the do-it-yourself market, it has found its way into the construction field. The ac welder here is being used to install reinforcing boxes around floor drains on the San Mateo Hospital job in California. It is welding a reinforcing angle with 3/32-inch-diameter Planeweld, an E-6013 electrode. The portable welder has a 100-amp capacity and can be operated on a standard 110 or 220-volt circuit, fused for 30 amps. For further information write to Lincoln Electric Co., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 259.

Bulk delivery, spreader cut cost on roofing job

Bulk delivery of roofing asphalt, plus an ingenious method of application, saved time and money for Alta Roofing Co., San Francisco contractor engaged in roofing the new 40-acre assembly plant for Ford Motor Co. at Milpitas, Calif.

The roof was built up over a steel decking of box channels, which were covered with ¾-inch Fiberglas insulation and three layers of felt. Over this was placed a total of 1,200 tons of Petrolastic asphalt 145, supplied by American Bitumuls & Asphalt Co., San Francisco.

Insulated tank trucks delivered 2,000 gallons of Petrolastic daily to the site, thus eliminating package and heating costs. At the job, the asphalt was placed in 350-gallon heating kettles and pumped to the roof through two ½-inch metal hoses controlled by a three-way valve.

In covering the 1,600,000 square feet of roof, the contractor used a 55-gallon drum, shop-mounted on a wheel carriage, in place of conventional spreading mops. Filled from the top, the drum spread the material by pouring it over a fan-shaped apron controlled by a spigot. This device enabled one man to pull the mobile unit, which applied the Petrolastic uniformly in a 3-foot-wide lane.

Centrifugal pump and motor combination

■ The Allis-Chalmers Model C-3 Electrifugal pump is described in a new bulletin available on request. The unit consists of a motor, supporting adapter, and centrifugal pump. It is available in capacities ranging to 2,500 gpm, with heads up to 400 feet.

Pump types described include models having a casing with removable suction cover and units with suction and discharge nozzles in one piece.

Alternate sealing arrangements are illustrated, including an external seal, an external grease seal, a single inside mechanical seal, and a double inside mechanical seal.

To obtain this literature write to Allis-Chalmers Mfg. Co., 951 S. 70th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 254.

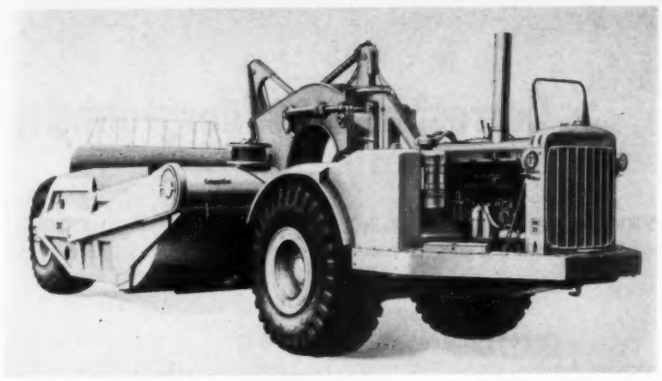
Bank on a *Task-Force* Truck

With pickup or heavy-duty Chevrolet model, you'll save money on the job —and be way ahead at trade-in time!

You save with modern high-compression power—In the ½-ton model, a new Thriftmaster engine is supplying the power punch. It's a new Loadmaster in the heavy-duty model (or a big 140-h.p. Jobmaster, an extra-cost option). With all of these great Chevrolet engines you get the most out of a gallon of gas. You accelerate fast, level the hills that could cut valuable time from your schedules. And even in cold weather you start more quickly with Chevrolet's hefty 12-volt electrical system. That's a big advantage in itself—a husky reserve of electrical power when you need it!

CHEVROLET

NEW CHEVROLET



The new Caterpillar DW21 (Series C) tractor with No. 470 scraper features a redesigned diesel engine rated at 300 hp at 1,800 rpm. The scraper is wider and longer than earlier models and has the new "lowbowl" design for easier and more economical loading. ►

New wheel-tractors and matched scrapers have increased power and easier-loading bowls

■ Two new additions to the Caterpillar rubber-tire tractor line feature turbocharged engines among other advances. The new units, the DW21 (Series C) and the DW20 (Series E) tractors, both have more horsepower than the current DW21 and DW20 tractors.

At the same time Caterpillar has announced that its DW15 tractor, just completing its first year in the field, has undergone some major design changes. Designated as the DW15 (Series C) tractor, it now features a new improved 186-hp $5\frac{1}{8} \times 6\frac{1}{2}$-inch engine. Included in the improvements is a new transmission case, designed to assure positive lubrication under the most adverse operating conditions.

Among major changes in the new DW21 and DW20 tractors is the use of a new diesel engine, rated at 300 horsepower at 1,800 rpm to power the units. Piston displacements is 805 cubic inches. To deliver greater horsepower, the 6-cylinder $5\frac{1}{8} \times 6\frac{1}{2}$-inch diesel engine is turbocharged. Driven by the engine's exhaust, the turbocharger utilizes energy that otherwise would be lost.

New design features built into the engine include a new block, crankshaft, connecting rods, pistons and head. A more accurate valve train gives better engine operation and requires fewer adjustments. Hydraulic valve lifters are reported to keep the valves in perfect adjustment, reducing maintenance costs. The diesel engine uses new paper-type fuel filters which are more efficient and less expensive in operation. A redesigned fuel system provides more accessibility for servicing.

Wide-base 29.5 × 29 tires in rock-type tread give the new tractors more versatility, operating at lower pressures for big-footprint flotation and wide-lug traction.

Speeds for the DW20 (Series E) range from a low of 2.8 mph to a high of 32.1 mph; on the DW21 (Series C) the range is from a low of 2.3 mph to a high of 20.5 mph. New clutches, new full-flow filters for the hydraulic steering system, and improved brake controls are among other changes. A choice of direct-electric or gasoline starting is available.

Caterpillar has also designed two new matching scrapers for the tractors: the No. 456 scraper for the DW20 (Series E) and the No. 470 scraper for the DW21 (Series C). These scrapers feature a new "lowbowl" design. Bowls are more shallow and, therefore, faster loading since less load-lifting effort is required. The manufacturer points out the higher a load must be hoisted by forcing material in from the bottom, the more horsepower is required. It is this internal resistance to loading that the new scrapers' "lowbowl" design reduces. In addition, a new high-lift apron gives faster more positive material ejection.

The wider and longer bowl increases the capacity of both units to 18 yards struck and 25 yards heaped.

For further information write to Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 316.

to Cut Your Operating Costs!

You save with the most modern truck features your industry has ever seen—New standard-width frames—more rigid with completely parallel side members. Panoramic windshield, High-Level ventilation, softer seats and new concealed Safety Steps—they're features that make Task-Force trucks extra easy to live with. Driving's less of a chore. And with driver efficiency up, you'll stay even with your tightest schedules, save money in the long run!

And you save with these extra-cost power helpers—You're bound to save money when you can maintain peak efficiency! You can't beat Hydra-Matic for easing the strain of stop-and-go hauling (available in ½-, ¾- and 1-ton models). Power Steering takes away as much as 80% of turning effort. And Power Brakes (standard on 2-ton models) add a lot of safety to everyday driving. You'll be glad to know that tubeless tires come at no extra cost on ½-ton models.

Why buy an old-fashioned truck and stand to take a licking at trade-in time? See your Chevrolet dealer for the most modern truck money can buy. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

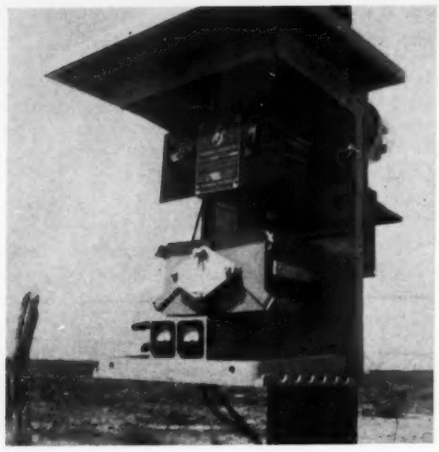
Task-Force TRUCKS

Data on fairleads for tractor winches

■ A specification sheet on fairleads for all models of Carco tractor winches has been released by Pacific Car & Foundry Co., Renton, Wash.

The new literature contains illustrations of all fairleads for use with Carco Model A, E, F, and J winches. A swivel fairlead for the Model A winch is also shown.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 213.



The compact arrangement of pipeline rectifier units is seen when part of the housing is removed. The transformer is at the top, the rectifier just below, and the output voltmeter and ammeter are at the bottom.

Corrosion of underground me sto

by WAYNE A. JOHNSON, president,
Corrosion Rectifying Co., Houston, Texas

The success of cathodic rectifying systems in protecting underground or underwater pipelines from corrosion may open the way for their more widespread use on a variety of metal structures either completed, under construction, or on the drawing boards. The system, which operates like a battery charger, has proved that it can reduce the cost of maintaining virtually any metal facility located underground or underwater, including bridge footings, anchors, and cables; dock pilings; offshore platforms; oil and gas-well casings; the hulls of ships and barges; and storage tank bottoms and interiors.

These structures are susceptible to leakage when corrosion, or electrolysis, causes minute particles of direct electric current to flow from a pipeline or other metal object into the surrounding soil and water. This current, in turn, removes particles from the steel pipe. But the cathodic protection system, by applying an equal or greater amount of electric current in the opposite direction, causes the metal to receive the charge and prevents it from corroding. The amount of current needed to go from ground anodes to the buried metal is comparatively small. This current passes from the positive terminal of a dc rectifier through a series of graphite-rod ground anodes, then through the soil, and to the metallic structure to be protected. The constant flow of current neutralizes damaging electrolytic action and stops corrosion.

Wide use on pipelines

Practically all major gas and oil companies are currently using the system to prevent underground lines from corroding. The millions of dollars spent annually to protect these investments is saving products which

Makes the grade with flying colors

NOW YOU can get Allison TORQMATIC Converters in the fast-running, smoother-operating Austin-Western Super 88 Power Grader.

When you do you'll get a grader that's easier to operate because its TORQMATIC Converter cuts the number of shifts needed to complete a pass or make a cut—allows the operator to concentrate on his bladework.

You'll get a grader that costs less to operate because the TORQMATIC Converter automatically keeps the engine running in its most efficient power range—broadens the engine's working ability by increasing engine torque 2½ times—holds power to the load at all times.

And you'll get a grader that costs less to maintain, too. The TORQMATIC Converter provides a shock-absorbing hydraulic cushion that protects grader components from shock damage—boosts engine life by preventing engine lugging and stalling.

Allison's 200-300 Series TORQMATIC Converters in the Austin-Western Graders carry their own oil supply—have a simple dip stick to check oil level. They're the first converter packages in the 40-150 horsepower range on the market with an integral oil cooler, sump and charging pump.

You can get Allison TORQMATIC Converters in a wide range of models for both gasoline or Diesel engines from 40 to 400 horsepower—TORQMATIC Transmissions for applications up to 300 horsepower. Ask your equipment manufacturer or dealer about Allison TORQMATIC DRIVES next time you buy or write for more information to Allison Division of General Motors, Box 894C, Indianapolis 6, Indiana.

Allison
TORQMATIC DRIVES

In a Hayward, there's no contact between the closing mechanism and the material handled. This "no contact" feature is a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

THE HAYWARD COMPANY
50 Church St., New York 7, N. Y.

HAYWARD BUCKETS
CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888

me stopped by low-cost system

Cathodic rectifying unit which reverses corrosion process can protect bridge footings, pipelines, tanks, and barges

might otherwise be lost, lowering repair expenses, and holding property damage to a minimum.

One system installed on a five-mile length of uncoated oil pipeline has already paid for itself many times over. This line had been in service for nine years, and corrosion leaks had started to appear less than two years after the pipe was laid. Results of a study showed that a total of 54 corrosion leaks had occurred in the pipe during a five-year period of operation. The cost of repairing this damage came to $10,800, and average of $200 per leak. The actual cost of maintaining the pipeline for this five-year period was about 30 per cent of the initial $36,000 cost of laying the line.

Leaks stopped abruptly when the cathodic rectifying system was installed at a cost of about $3,500. The total cost of protecting the line—including the cost of electric power for ten years—was determined to be less than $7,000. Since the system was installed, only one leak has occurred. But if leaks had occurred for another three years at the rate prevailing before the system was set up, the cost of repairs would have equalled the cost of constructing the entire line.

THE END

Poor & Co. forms new design division

Crusher Engineering, a new division of Poor & Co., with headquarters in Philadelphia, Pa., will be concerned with design and engineering of a new line of jaw and roll crushers, hammermills, impact breakers, Bradford breakers, and pulverizers.

John Plimpton is the vice president in charge of the new division, and F. H. Neely is chief design engineer.

TRANSITS AND LEVELS

You will find the best bargains at Warren-Knight. New or rebuilt—for sale or for rent—We will buy or trade your used transits, levels, alidades, etc. Send your instruments for valuation.

Write for free catalog EC-57 of instruments, field equipment and drafting room supplies.

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"I understood everything—until I read the instructions"

Smoother, easier driving...mile after mile ...on the Schuylkill Expressway

Schuylkill Expressway, Philadelphia, Pa.

Across America, wherever traffic is heavy and fast, the need is for roads that can *take* it. Roads with joints that stay closed, smooth, free from troublesome, costly maintenance. Many such roads are proving themselves daily . . . through the use of Flexcell Bituminous Fiber Expansion Joint Filler.

Severest traffic and climatic conditions have tested tough, durable Flexcell Expansion Joint Filler . . . shown it to be a big cost-saver in long years on the job. The reason: The extreme resiliency of its rugged cane fiber board core. When concrete expands, Flexcell Expansion Joint Filler compresses without extruding. As concrete contracts, the filler springs back to normal. Joint stays neat, smoothly closed. Laboratory tests prove that even after compression to 50% of original thickness, a "recovery" of over 70% is made.

Flexcell Expansion Joint Filler is low in cost, easy to work with, provides finished joints without trimming. Impregnated with a durable asphaltic compound to resist moisture. Protected against dry rot and termite attack by exclusive Ferox® Process. Will not become sticky or brittle with weather changes. And its rough-textured surface makes a firm bond with concrete. It's ideal for work involving special cutting, tapering, fabricating.

Leading engineers, contractors, architects, many Federal, State, and Municipal agencies have long specified Flexcell Expansion Joint Filler. Investigate the advantages of this widely-preferred filler before you start your next job.

Mail coupon for full data on benefits and economies of Flexcell Bituminous Fiber Expansion Joint Filler for roads, runways, sidewalks, curbs, gutters, driveways, concrete floors and roof decks. No obligation.

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*Flexcell is a Trademark identifying Bituminous Fiber Expansion Joint Filler marketed by The Celotex Corp.

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120 S. LaSalle St., Chicago 3, Illinois

Without obligation, please send me complete data and prices on Flexcell Bituminous Fiber Expansion Joint Filler.

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Address.....

City..... Zone..... State.....

Concrete vibrator with motor in head can be handled easily by one man

■ A lightweight vibrator that makes it possible for one person to vibrate newly poured concrete without assistance has been placed on the market by Master Vibrator Co., 165 Stanley Ave., Dayton 1, Ohio. The new one-man tool has a powerful motor inside the vibrating head.

Since it does not require an outside motor or engine, the vibrator eliminates the need for a second workman. Furthermore, because there is no heavy flexible shaft or core, there is no loss of power from motor to vibrator.

Operation of the tool is simple. The workman simply plugs the vibrator's electrical extension cord into the nearest 115-volt ac or dc outlet or portable generator, drops the vibrator head into the concrete, and guides it. The casing acts as a handle. When the job is finished, he rolls the vibrator up like a hose and carries it to the next batch of concrete. The entire unit weighs only 25 pounds.

A safety thermostat in the head stops the motor to prevent overheating, and restarts it when it has cooled. The casing carries only electric wires back to the cable, and there is no flexible shaft to wear it out. An on-off switch 7 feet from the head is sealed so that it can be immersed in concrete. No oiling or greasing is necessary.

For further information write to the company, or use the Request Card at page 18. Circle No. 252.

A workman is holding one of the new Master vibrators.

Tractor-mounted sweeper

■ A new tractor-mounted sweeper for the Oliver Super 55 tractor has been announced by the M-B Corp., New Holstein, Wis. The sweeper features a standard broom 72 inches long and 32 inches in diameter. This broom can be turned end for end for more even wear. The ground pressure of the broom is adjustable and spring-loaded to absorb shocks and bumps.

Simple in design, the new sweeper can be easily mounted and removed. Its hood can be removed for snow sweeping. The tractor's hydraulic system is used to raise and lower the broom with fingertip control.

Other M-B sweepers are available for most wheel tractors and for the Willys Jeep.

For further information write to the company, or use the Request Card at page 18. Circle No. 267.

AITC elects officers

At the recent annual meeting of the American Institute of Timber Construction, Frank B. Benzon was elected president of the organization. Mr. Benzon, president and general manager of Timber Structures, Inc., of California, Richmond, Calif., succeeds Max C. Hanisch in the post.

Other officers elected at the same time are: George E. Schweitzer, vice president; Val Gardner, treasurer; and Miss Barbara Kelley, secretary.

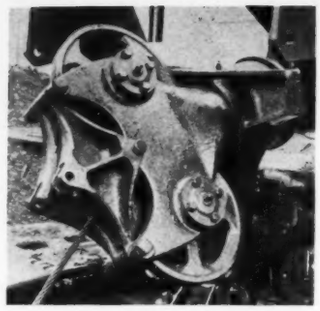
New rotating fairlead for 3/4-yard draglines

■ A new full-rotating fairlead that is now standard equipment on present Bucyrus Erie 22-B draglines is also available for models already in the field. Supplied with suitable bracket and anchor pin, the fairlead replaces the swinging or hinge-type unit on the ¾-cubic-yard machines.

The new rotating fairlead instantly assumes the plane in which the rope bends over the sheave. Equipped with tapered roller bearings, it rotates so freely that its adjustment to the line of pull is instantaneous.

The fairlead is located off center of the revolving frame in line with the rope lead from the center of the drum. The fairlead frame is symmetrical and carries two identical sheaves, either of which can rotate to an up or down position.

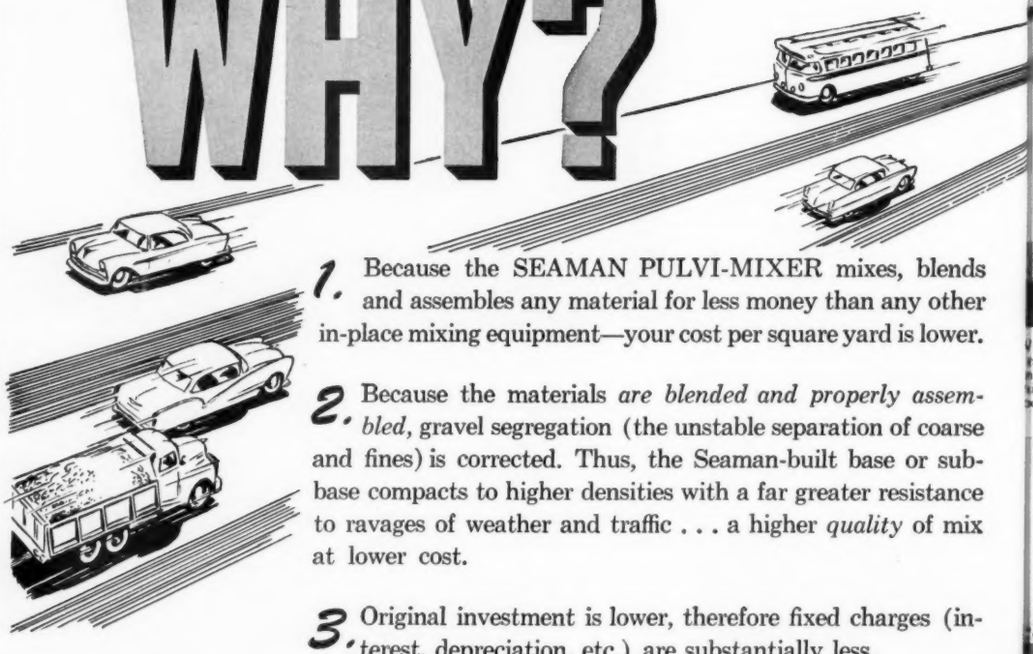
Neither guide sheave nor rollers are



This new rotating fairlead is now standard equipment on the Bucyrus-Erie 22-B dragline.

QUALITY ROADS built with the SEAMAN PULVI-MIXER Cost Less Than Poor Roads

WHY?



1. Because the SEAMAN PULVI-MIXER mixes, blends and assembles any material for less money than any other in-place mixing equipment—your cost per square yard is lower.

2. Because the materials *are blended and properly assembled*, gravel segregation (the unstable separation of coarse and fines) is corrected. Thus, the Seaman-built base or subbase compacts to higher densities with a far greater resistance to ravages of weather and traffic . . . a higher *quality* of mix at lower cost.

3. Original investment is lower, therefore fixed charges (interest, depreciation, etc.) are substantially less.

4. Savings in maintenance costs on Seaman-built roads are so substantial that those dollars can be channeled into new road programs.

A comprehensive Seaman-Andwall Bulletin recently issued describes Seaman-mixing and Seaman equipment in interesting detail. Illustrates many field scenes and different types of stabilization. Send postcard today. Ask for Bulletin TPS.

required on the new fairlead's hollow frame. The least contact of the rope with the guide plates causes the frame to rotate into line with the rope pull, so that chafing of the rope on the guide plates is negligible. The guide plates are reversible.

For further information write to Bucyrus-Erie Co., South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 202.

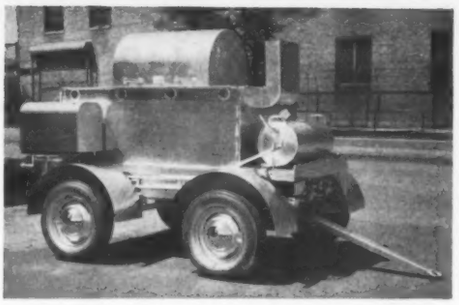
Flexible metal hose for varied applications

■ A revised edition of its catalog on flexible metal hose is now available from the Atlantic Metal Hose Co., 308 Dyckman St., New York 34, N. Y.

The catalog includes descriptive material on flexible metal interlocking high-pressure hose, air-jacketed hose for diesel exhausts, and conveyor hose for ventilating and exhausting. A second section refers to flexible, seamless, high-pressure hose and diesel-exhaust hose. There is also data on metal-lined gasoline hose and synthetic-rubber gasoline hose. A final section contains information on couplings.

General application data is provided in the form of a U. S. Navy Department test table for bronze and steel hose. Also included is data on bending diameters, hydrostatic bursting pressures, and a series of installation diagrams.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 224.



The new White Model F-7 wheel-mounted asphalt and tar-heating kettle.

Asphalt heating kettle has four-wheel chassis

■ A new unit in its line of asphalt and tar-heating kettles has been announced by the White Mfg. Co., Elkhart, Ind. The portable Model F-7 has a capacity of 325 gallons. It is equipped with two kerosene burners and a 20-gallon fuel tank. Propane burners are optional.

As with other White kettles, Model F-7 is furnished with a fireproof top, especially valuable when the unit is used to heat cutback and other highly inflammable bituminous materials. The kettle can also be supplied with a hinged top, or with a warming hood for an extra barrel.

The new White kettle can be equipped with hand or engine-driven spray pump, flexible metal or rubber steam hose, and spraybar with insulated handle. Dial-type direct-reading thermometers are supplied. Hand or power agitators are also available.

Weighing 2,175 pounds, the new heating kettle is mounted on semi-elliptic springs and four 6.50 × 16 six-ply tires on Timken bearing steel wheels.

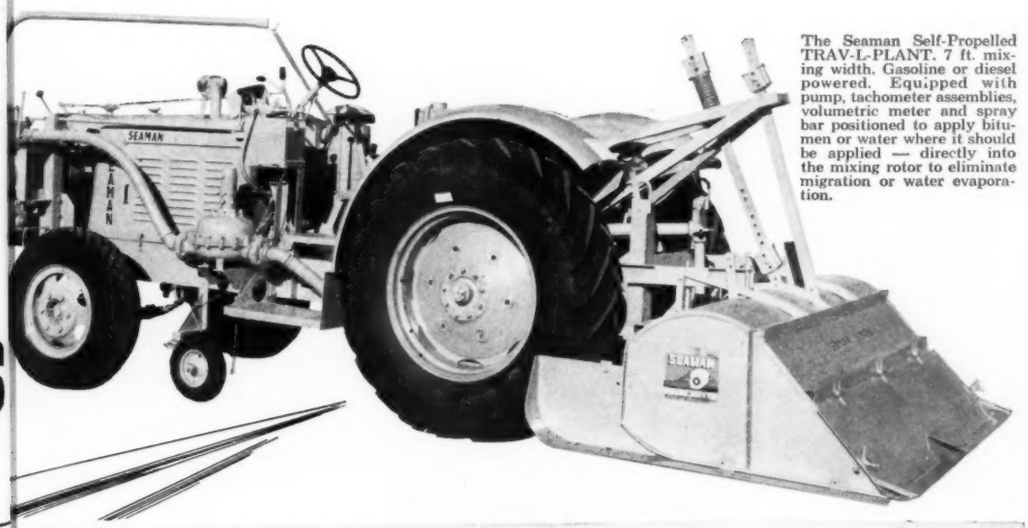
For further information write to the company, or use the Request Card at page 18. Circle No. 261.

New shot-hole drill head

■ A fish-tail screw bit is the latest addition to the Pengo line of earth-boring tools. Available in ten sizes of drill heads ranging in diameter from 2½ to 10 inches, the tool is suitable for boring to depths of about 300 feet.

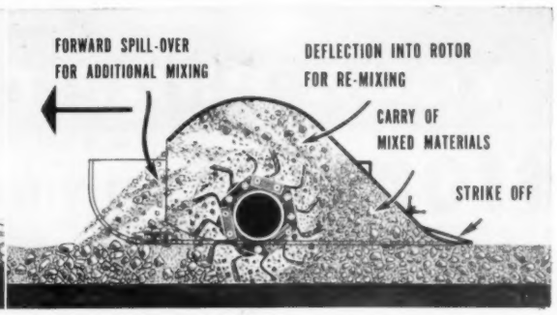
The new bit is designed for use with any make of continous helix-type auger for vertical or horizontal drilling of any type requiring small-diameter holes. It is said to drill rapidly through limestone, etc.—any material other than solid hard rock.

For further information write to Petersen Engineering Co., Santa Clara, Calif., or use the Request Card at page 18. Circle No. 253.

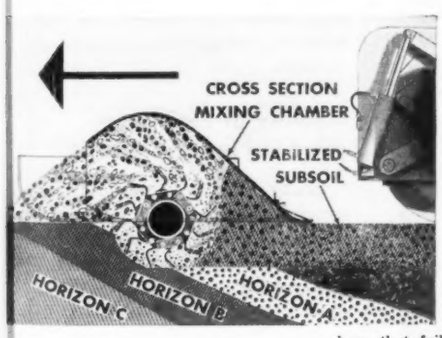


The Seaman Self-Propelled TRAV-L-PLANT. 7 ft. mixing width. Gasoline or diesel powered. Equipped with pump, tachometer assemblies, volumetric meter and spray bar positioned to apply bitumen or water where it should be applied — directly into the mixing rotor to eliminate migration or water evaporation.

When gravel is dumped on a roadway, larger stones fall first. Next come the fines. Thus alternate pockets of coarse and fine are formed. When these are bladed for mixing this segregation is made worse and the pavement will soon break up.



But when the Seaman Pulvi-Mixer is used, that unstable segregation (always present when aggregates are transported, moved or pushed) is perfectly blended and the materials are properly assembled so that the coarse stone is keyed and interlocked and the voids are filled with the fines. Thus the stone is securely mortared-in. A Seaman-built base or sub-base lasts for years.



Sub-grades have their own types of segregation for they consist of soils of varying characteristics and varying reactions to moisture. Only by blending these with the Seaman Pulvi-Mixer can uniformity in moisture, density and thickness be attained. And only then have you built a low cost SUB-BASE that reacts uniformly to weather and pounding traffic.

Here is a typical pavement failure due to two conditions: (1) an unstabilized sub-base that failed because of moisture permeation; (2) a segregated condition of the aggregates when the base course was inadequately mixed. Both these causes could have been prevented with the Seaman PULVI-MIXER.

Your Seaman-Andwall distributor has these cost and performance facts ready for your investigation. Call him now to get full advantage of the Seaman Pulvi-Mixer this season.

SEAMAN-ANDWALL CORPORATION

282 N. 25TH ST. • MILWAUKEE, WISCONSIN

AVOID LEGAL PITFALLS

Arbitration clauses

THE PROBLEM: *A Connecticut building contract specifically provided for arbitration of any dispute as to the value of extras, but it did not directly provide for arbitration of other disputes. However, the contract did say that all work was to be done according to the architect's plans and specifications, which stated that certain pages of a form issued by the American Institute of Architects should apply. Those pages included provision for arbitration of disputes in general. The contractor did not read those pages. Was he barred from suing for the reasonable value of work and materials furnished and for damages for alleged breach of the contract by the owner, without first seeking arbitration?*

THE ANSWER: Yes. (Batter Building Materials Co. v. Kirschner, 110 Atl. 2d 464, decided by the Connecticut Supreme Court of Errors.)

The court applied these general rules of law applicable to contracts in general:

Where a written contract refers to another document, in such way as to show intention that it be considered part of the main contract, the two papers must be read together, as if all the provisions of the second document had been embodied in the main contract.

A party to a contract cannot repudiate a clause in it on the ground that he signed without reading, unless he can show that the clause was accidentally or fraudulently inserted by the other party.

Incidentally, the court noted that right to enforce an arbitration clause may be waived by acts indicating intent not to rely upon the clause, such as delay in seeking arbitration or failure to follow the steps agreed upon as a condition to compel arbitration.

Contractor may sue for part-performance pay

THE PROBLEM: *Under Texas law, may a contractor sue for pay for part performance of a contract (1) where the owner has prevented full performance or has broken his part of the agreement and justified the contractor in quitting, or (2) where the contract provides that if the work is not completed, the contractor can collect the contract price, less the reasonable cost of completing the job according to plans and specifications?*

THE ANSWER: Yes. (Sullivan v. Dubois, 271 W. W. 2d 316, decided by the Texas Court of Civil Appeals, Galveston.)

Truck safety orders

THE PROBLEM: *A member of a paving crew was fatally injured by a dump truck when it was backing up. Was the liability in damages of the truck owner and driver affected by provisions of the California Safety Code and Orders, applicable to the "excavation, construction, alteration, repairing, renovating, removal, or wrecking of buildings or other structures"?*

THE ANSWER: Yes. (Armenta v. Churchill, 267 Pac. 2d 303, decided by the California Supreme Court.)

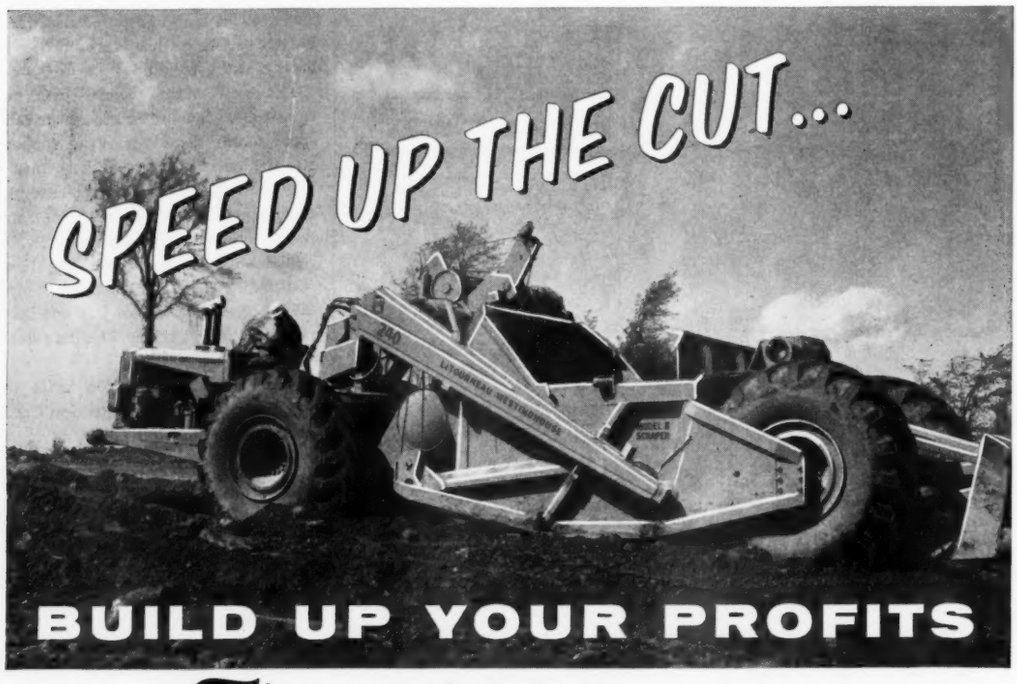
The court decided that the repair and resurfacing of highways fall within the code provision covering "other structures" and that a safety order relating to trucks was valid. In substance, the order required that trucks used to haul dirt, rock, concrete, and other construction materials should be equipped with a horn, bell, or whistle on both ends, that can be heard, under normal operating conditions, at least 200 feet to the rear.

The court said that the order was not invalid as being discriminatory even though it applied only to trucks hauling certain materials. The court also noted that the order provided a minimum standard of care for the safety of nearby workers. If an accident like that involved in this case can be found to have been directly caused by failure to comply with the safety order, the truck owner and driver can be held liable for resulting damages.

Liability of contractor after job is accepted

THE PROBLEMS: (1) *Because of the owner's carelessness, the roof of a new building leaked. Could he offset damages against the amount due the contractor?* (2) *After being used for some time, a furnace exploded. As there was no proof that it had not been properly installed, was the owner entitled to an offset?*

THE ANSWERS: No. (Churchill v. Anderson, 128 Fed. Supp. 425, decided by the United States District Court, Western District of Kentucky, Louisville.)



WITH Firestone NYLON TIRES

Firestone Nylon Off-The-Highway truck tires are specifically engineered to deliver more hours of service on the toughest earth moving, rock work or strip mining job.

You speed up your job and operate at lower cost on Firestone Nylon truck tires because the treads give maximum traction and they are extra tough to resist cutting. The sidewalls are double thick to give added protection against cuts and snags. The new Firestone Safety-Tensioned Gum-Dipped* nylon cord body insures longer tire life and more retreads. It gives the greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone Nylon Off-The-Highway tires will cut your downtime and increase your profits.

*T.M. Reg. U.S. Pat. Off.

When you buy new equipment or replacement tires, ... specify FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

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Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Contractor not liable for defective plans

THE PROBLEM: *A contractor for heating and plumbing on a large building job followed plans and specifications that had been prepared by an architect. The work was inspected while in progress on behalf of the owner and was accepted on completion. Later, gas which had collected in a chimney exploded and caused considerable damage. That a gas-operated generator had not been properly installed was not conclusively proved. Was the contractor liable for the explosion damage since he had not warranted the plans and specifications and had done his work carefully?*

THE ANSWER: No. (Trustees of the First Baptist Church, Corinth, Miss. v. McElroy, 78 So. 2d 138, decided by the Mississippi Supreme Court.)

The court said that the appellate courts throughout the country have generally reached the same conclusion regarding construction work. But the court noted that some courts draw a distinction between cases where damage occurs after the work has been completed and accepted and cases where damage occurs in the course of construction. The contractor may be held liable in the latter class of cases under certain conditions.

Increase in wages on government projects

THE PROBLEM: *An invitation for bids on a federal project stated that wage rates set forth in the contract were subject to wage stabilization and that no increase of pay would be allowed if applicable wage schedules were increased by the wage adjustment board. Was the contractor entitled to reimbursement for increased wages because the contracting officers had failed to notify him before the contract was let, that the board had granted wage increases effective later and that request for another wage increase was pending?*

THE ANSWER: No. (Ross Engineering Co. v. United States, 127 Fed. Supp. 580, decided by the United States Court of Claims.)

Labor law does not apply

THE PROBLEM: *Were the overtime provisions of the Federal Fair Labor Standards Law applicable to a Massachusetts contracting company while it was erecting a university building in New York, even if the supplies, materials, and machinery were shipped to the construction site from other states?*

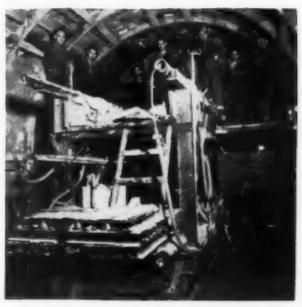
THE ANSWER: No. (Oberdorfer v.

STRONG · DURABLE KINKPROOF . . . for *Maximum Service and Safety*

A GOODALL *"Standard of Quality"* PRODUCT

"ALLGOOD CORD" *Manifold and Caisson* AIR HOSE

A super hose in every respect, built for two important fields of service . . . manifold lines to jumbos, wagon drills and drifters, where its extra strength and durability assure steady power to the drilling tools; and "life" lines to caissons, where its tough, kink-proof construction precludes the risk of failure in the air supply.



The tube, carcass and cover of "Allgood Cord" are combined to form a hose structure which will withstand high pressures constantly applied; continual dragging over rough surfaces; and blows inflicted by falling rock, tools and timbers. Made in 1½" to 4" sizes, in maximum lengths of 50 feet. *Contact our nearest branch for details.*

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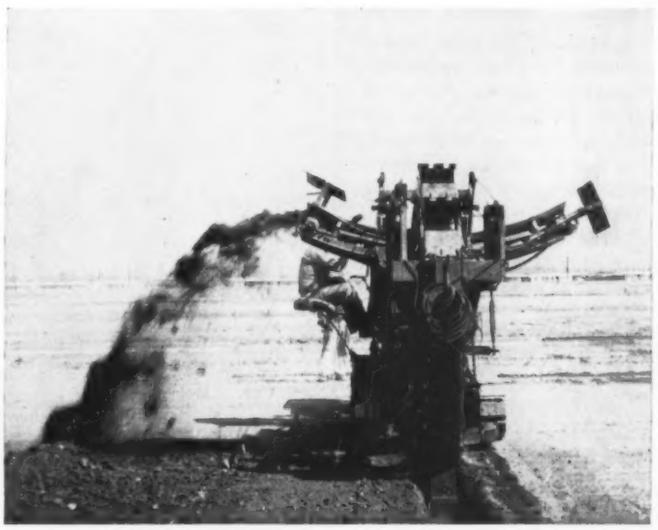
Est. 1870



Digs 51,570 house footings – digs 'em all with Clevelands

J. C. BOWLES & SON, contractors in Whittier, California—using Cleveland trenchers exclusively—have dug footings for 51,570 homes throughout the Los Angeles area during the past 5 years. Bowles says that "no other machine will do this work so cheap and so fast and give you such a clean finished job." He has purchased seven Clevelands since 1950.

The Cleveland Model 95 shown above is cutting footings trenches on a 250 home project in Lakewood City, California. One of the four Clevelands Bowles is currently operating, this fast-moving trencher completes 20 footings per day. Each footing in this group requires over 300 feet of trench, 13 inches wide by 12 inches deep.

Bowles' Cleveland "Baby Diggers" are perfectly balanced on smooth non-packing crawlers 100% anti-friction bearing equipped. Their extraordinary ease of maneuverability and long life, free from track maintenance, are especially valuable in this work requiring so many moves and changes of direction each day.

The famous Cleveland crawler transmission—providing over 30 smoothly graduated power and speed combinations under fingertip control—and Cleveland's fast accurate boom hoist

control account for the overwhelming popularity of these machines on all types of trenching work . . . house services, gas and water mains, cable and conduit trenching, farm drainage and irrigation work, highway widening and drainage, and oil and gas pipelines.

Your local distributor will show you how Clevelands do more—for less

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND

Rappoli Co., 137 N. Y. Supp. 2d 14, decided by the New York Supreme Court, Special Term, Onondaga County.)

The court cited a decision by the United States Supreme Court and one by the United States Court of Appeals, Ninth Circuit, to the effect that employees engaged in the original construction of a building do not generally come within the federal statute. This applies even if the building, when completed, will be used to produce goods for interstate commerce.

Specifically, it was decided that transmitting records, reports, payrolls, and communications from the job location in New York to the home office in Massachusetts did not involve a timekeeper in interstate commerce activities.

Unspecified item part of over-all contract

THE PROBLEM: *The prime contractor on an air-force base rehabilitation job sublet the painting. The subcontract did not specify that the office area of buildings was to be painted, but it was based upon an estimate that 156,000 square feet of painting, in all, would be required. Excluding the office area, the subcontractor painted only 93,000 square feet. Was he entitled to extra pay for painting the office area?*

THE ANSWER: No. (United States v. Maxon, 122 Fed. Supp. 953, decided by the United States District Court, Western District of Oklahoma.)

The court said that the estimate showed that painting of the office area was contemplated by both the prime contract and the subcontract. Apparently, it took the office area to approximate the total estimated 156,000 square feet.

Compensation allowed to widow of lightning victim

THE PROBLEM: *A road contractor's employee was electrocuted by lightning as he stood on a new wet road grade 10 feet high. Did the fact that his height and position made him a special target for lightning show that his death was accidently caused in the course of his employment? Was his widow therefore entitled to an allowance under the South Dakota Workmen's Compensation Law?*

THE ANSWER: Yes. (Bergren v. S. E. Gustafson Construction Co., 68 N. W. 2d 477, decided by the South Dakota Supreme Court.)

Wage withholding for income-tax purposes

THE PROBLEM: *Does the statutory bond of a federal-works contractor to pay employees' wages render the surety liable for amounts withheld by the contractor but not paid over by him to the Collector of Internal Revenue?*

THE ANSWER: Yes. (United States v. Standard Engineering Co., 125 Fed. Supp. 918, decided by the United States District Court, Eastern District of Virginia.)

The court said that sound administration of the federal laws "requires that the income from wages withheld be definite and certain, and that can not be if sureties are not held liable to their contract for full payment of wages."

Materialman's right on contractor's bond

THE PROBLEM: *A subcontractor and his wife owned half of the stock of the corporate prime contractor. A supplier furnished materials to the subcontractor on a federal project. Was the prime contractor and its surety on a payment bond given under the Miller Act liable to the supplier which had failed to give written notice to the contractor of its claim?*

THE ANSWER: No. (United States v. Robbins, 125 Fed. Supp. 25, decided by the United States District Court, District of Massachusetts.)

The court said that there was additional ground for denying the supplier the right to enforce its claim against the bond, in the fact that the supplier did not prove that the materials sold to the subcontractor were used on the particular project.

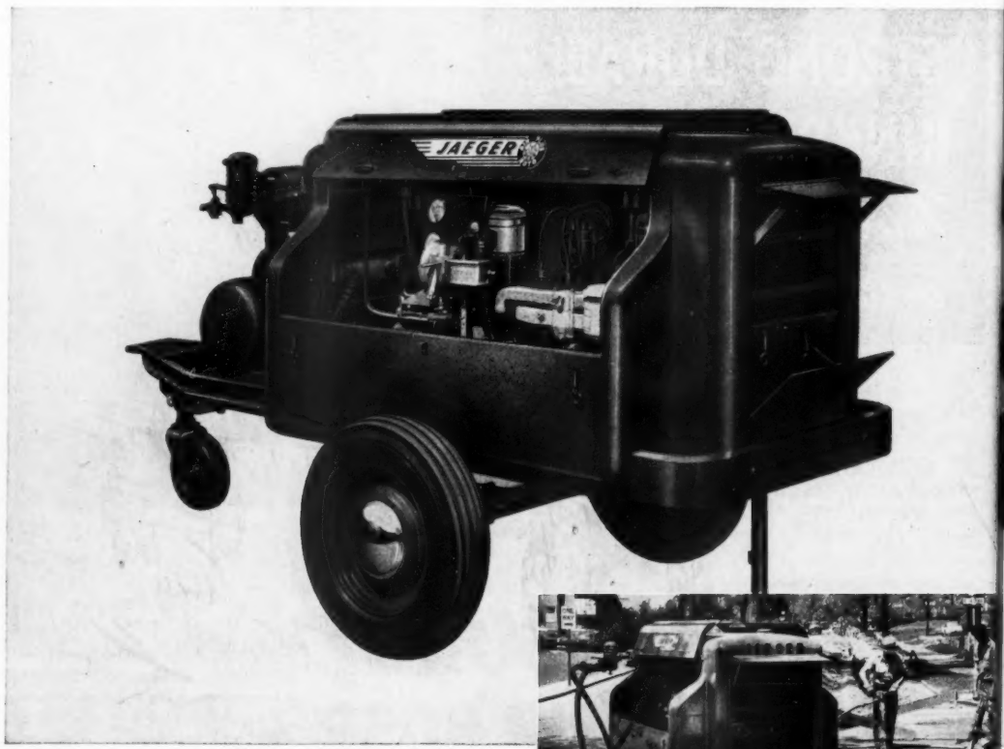
Sewer tunnel sank

THE PROBLEM: *A 9-ton truck sank when a street surface collapsed into a sewer tunnel that was under construction by a subcontractor. Were the city and the subcontractor liable for the driver's injuries?*

THE ANSWER: Yes. (Potere v. City of Philadelphia, 112 Atl. 2d 100, decided by the Pennsylvania Supreme Court.)

The court said that the city and the subcontractor had known for two days prior to the accident that the street surface had partly subsided, and the subcontractor ought to have known by the amount of water under them that tne mains had been fractured.

It was proper for the subcontractor to show that customary working methods had been used. But, in view of the fact that side jacks were found to be bent, it was for the jury to decide whether the subcontractor had been negligent in failing to detect the cause of the original subsidence and in failing to sufficiently support the barrier at the head of the tunnel.



ROTO 125 operated two 80 lb. pavement breakers at full efficiency on this conduit job, line cutting and breaking 1200 sq. ft. of brick under asphalt per 8 hour shift with an average consumption of only 1½ gallons of fuel per hour.

Now we can announce what users have known for a year

Jaeger Roto air-plus is the firs

Instant air delivery, exactly regulated to demand, maintains constant pressure as smooth as steam.

High efficiency results in slower operating speeds, the lowest fuel consumption and longest engine life of any rotary compressor.

After 5 years development work, Jaeger engineers perfected the first fully efficient 2-stage oil-cooled rotary compressor early in 1954. Since then, Jaeger "Roto" units have logged thousands of hours on all types of application from street work to heavy rock drilling and pile driving.

Performance has consistently excelled even the best of other rotary compressors. On typical quarry work, for example, operating two 4" wagon drills with air-tugger hoists in hard limestone, 10 hours a day, a Jaeger Roto "600" averaged 7 gallons of fuel an hour in 2200 ho here are of operation. Its engine never ran faster than 1600 r finned A Roto "125", handling the air demands of two he ver 100 duty paving breakers, shows an equivalently low f dry sta consumption of approximately 1½ gallons an hour. oil filter radiator

Simple, close, continuous control

Control of engine and compressor is so effective t ub-zero s. Tool 100 lbs. minimum pressure is constantly maintained o the entire operating range. Speed modulation is smo and stepless. Instantaneous control positively preve meet th overrun and resultant racing of the engine. Further y type c controls are extremely simple, without metering orifi " is co complex linkage or toggles. When starting, you mer . *For th* make one half-turn of a regulator crank to set eng *Jaeger* fuel control on "Idle." All controls are convenie *availab* grouped on one side of the compressor. *ption of t*

Consulting engineers and the federal labor law

THE PROBLEM: *An Iowa consulting engineer furnished to clients drawings, plans, specifications, and estimates for projects located in other states. Were his employees engaged in "interstate commerce" or in the "production of goods for commerce," within the coverage of the Federal Fair Labor Standards Law?*

THE ANSWER: No. (Mitchell v. Brown, 126 Fed. Supp. 603, decided by the United States District Court, Southern District of Iowa.)

The court differentiated the case from one where draftsmen and timekeepers were allowed overtime under the federal statutes because they were employed by contractors who were dredging channels in navigable waters.

Seller is liable for mistake in mix

THE PROBLEM: *A concrete contractor bought a mix supposed to be that known as 1-2-4, for use in constructing a driveway. The material delivered by the seller was a 1-3-5 mix. The contractor used it—apparently unaware that he had not gotten what he ordered—and had to reconstruct the driveway. Could he hold the seller liable for the cost of reconstruction?*

THE ANSWER: Yes. (De Fiore v. Peffers, 124 N.E. 2d 733, decided by the Ohio Court of Appeals, Cuyahoga County, Cleveland.)

The PixTone picks up, carries, and dumps stones mechanically.

Mechanical stone picker for landscaping work

■ An answer to the high labor cost of clearing fields of stone is the PixTone mechanical stone picker. The machine is a two-wheel trailer-type unit pulled by a tractor. It clears a 40-inch-wide strip, picking up stones from 1½ to 8 inches in diameter. No power takeoff or hydraulic mechanism is required.

The picking mechanism is driven by a separate air-cooled gasoline engine through a steel roller chain over steel sprockets. This arrangement provides steady power regardless of tractor speed.

As an adjustable rake goes along the surface of the ground, picking teeth throw the stones against the circular rake and into the stone box. Capacity of this box is 2,500 pounds or about ¾ yard.

The picking teeth are controlled by torsion springs which absorb shock. A slip clutch with specially hardened faces permits the teeth to stop instantly should the picking mechanism become overloaded.

When the stone box is loaded, the rake is raised and the machine pulled into a dumping spot. The stones are dumped automatically from the tractor seat by tripping a lever.

For further information write to Bridgeport Implement Works Inc., 1483 Stratford Ave., Stratford, Conn., or use the Request Card at page 18. Circle No. 244.

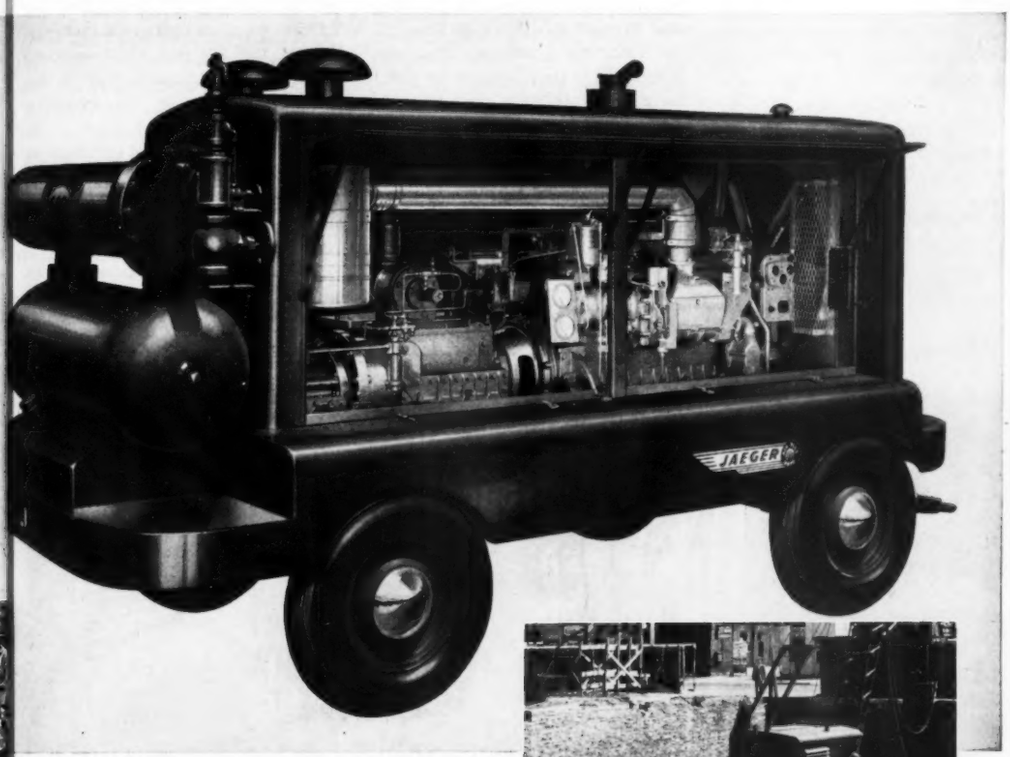
All-weather lubricants

■ A folder on a line of all-weather lubricants lists recommendations for average conditions of service on outdoor equipment. The Gredag lubricants are said to withstand extreme heat and cold, as well as rain, sleet, and grit.

Cable and chain, open-gear, bearing, enclosed or pan-dipping gear, and wheel-bearing lubricants are among those listed. Also covered is the application of pressure-gun, track-roller, and high-temperature crane and shovel lubricants.

The Gredag line includes, in addition, multipurpose lubricants that reduce the number of different types formerly required for the proper care and maintenance of outdoor machinery.

To obtain this literature write to Gredag, Inc., Niagara Falls, N. Y., or use the Request Card at page 18. Circle No. 321.



TO 600, holding steady 100 lbs. pressure for 160 king hours (as smooth as steam) kept this Vulcan l hammer hitting 60 full power blows per minute, air to spare for breaker and clay spade work.

rsully efficient rotary compressor

200 ho here are many further advantages. Jaeger's copper 600 rp finned multi-pass oil cooler insures cool operation wo he over 100° weather. Automatic by-pass valve means low f "dry starts" in cold weather. Multiple perforated nour. oil filters won't corrode, absorb or freeze. Adjust- radiator shutters maintain engine water temperature ub-zero days. All sizes have accessible 8-hour fuel ctive t s. Tool boxes on the "125" hold a full set of tools. ined o is smo

Available in 125 and 600 cfm sizes

prev o meet the principal demands of users who prefer the therm y type compressor, current production of the Jaeger g orifi o" is concentrated in the popular 125 and 600 cfm u mer *For the many air users who still prefer the piston* et eng *Jaeger reciprocating Air-Plus compressors continue* nvenie *available in the "new standard" ratings with the* ption of the 600 c/m size.

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TRUCK MIXERS • PAVING MACHINES

Amphibious derrick erects bridge steel

The derrick handles a piece of structural steel. The rig's 170-foot boom and 40-foot jib enable it to work easily at a high level. The "sea mule," foreground, serves as a towboat for the floating equipment.
C&E Staff Photos

The combination of a giant amphibious derrick and a set of ingenious telescopic falsework bents was the key to the erection—in one season—of the structural steel superstructure for the new 4,482-foot bridge across the Missouri River at New Town, N. Dak.

Working first from the valley floor on the west or right bank of the river, the derrick set 2,000 feet of deck girder and continuous deck truss reaching from the right abutment to the channel of the river. Having reached the bank of the river, the rig then took to its pontoons to set a three-span continuous through-truss 1,425 feet long. Still floating, the derrick operated in a channel dredged through the shallow water near the left bank to set the remaining deck trusses and girders.

During the 1953 construction season, this same derrick dismantled the 1,425-foot truss bridge which formerly crossed the Missouri at Elbowoods, about 40 miles downstream from the new bridge site (see "Floating Rig Dismantles Old Bridge", C&E, June, 1954, page 12). The steel members of this bridge were trucked to the New Town site and reassembled to make up the main-channel spans of the new structure.

In the meantime, substructures

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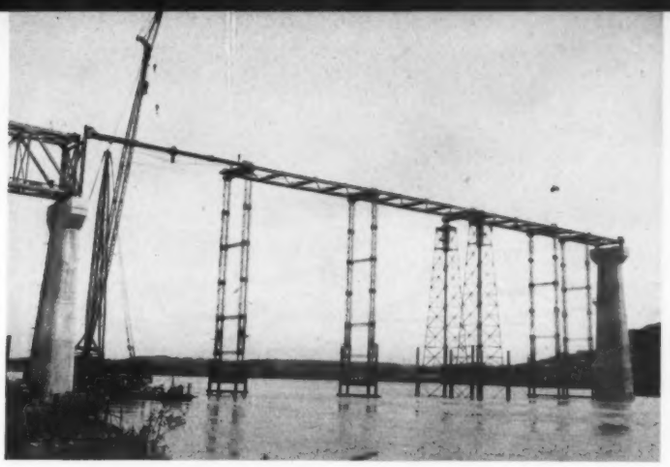
New high level highway bridge in Garrison Dam project incorporates truss spans taken from dismantled bridge



An upstream view, showing assembly of the salvaged span on the east side of the river. Adjustable falsework bents support the span of salvaged steel which extends from the shore pier at left to mid-river.

were being built by Massman Construction Co. and Kansas City Bridge Co., both of Kansas City, Mo. The massive T-shaped reinforced-concrete piers are all founded on Fort Union formation, a sedimentary deposit which underlies this entire area. Three of the piers near the right bank rest on spread concrete footings, while the other ten are supported on steel H-piles driven through the sand, gravel, and silt of the river valley into the underlying Fort Union shale. Some of these H-piles were as long as 130 feet. Work on the piers started early in 1951 and was completed late in the fall of 1953.

General contractor for the superstructure is Manhattan Construction Co., Muskogee, Okla. Steel erection was sublet to John F. Beasley construction Co., also of Muskogee, and the concrete work on the deck is being done by The Maxwell Bridge Co., Columbus, Kans.

The new span, which carries North Dakota State Route 23 connecting New Town and other North Dakota points with Fairview, Mont., is being constructed as a part of the Garrison Dam and Reservoir project. The huge reservoir being impounded behind Garrison Dam will inundate the entire surrounding valley, including the old bridge site and the site of the village of Sanish.

Only the streets remain to indicate where the village of Sanish stood. Its inhabitants and most of the buildings have been moved to a new location on higher ground appropriately called New Town. It is expected that Missouri River water will rise in the reservoir to a level flooding the village site and the old bridge approaches before the new structure is completed and opened for traffic.

Open by November

According to current schedules, the bridge should be open to traffic by November of this year, although it will take until the following July to put on the finishing touches and complete the painting. Contract price for the superstructure is $2,250,000, and the entire project—including removal of the old bridge—is expected to exceed $5 million.

Although the over-all planning and most of the specific contracts in the Garrison Dam and Reservoir project are handled directly by the Garrison District of the U. S. Army Corps of Engineers, the design of this bridge was the work of Howard, Needles, Tammen & Bergendoff, Kansas City, Mo. Field supervision and inspection

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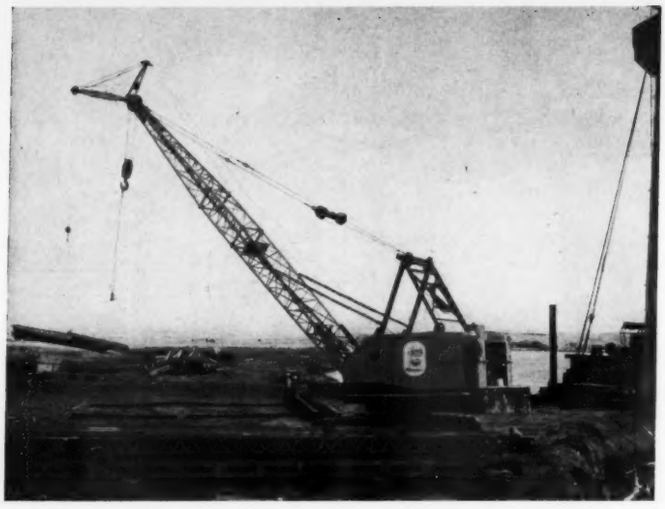

A Koehring 1005 crane sorts steel on the ground preparatory to loading a barge for the trip to the erection point. In the foreground is a timber-supported track which the amphibious derrick rides when working on land.

(*Continued from preceding page*)

were provided by the Corps of Engineers' staff.

Stiffleg-guy derrick

Beasley's big derrick has a unique combination of stiffleg and guy features. Its heavy steel subframe is triangular in shape, with the mast mounted at the middle of one of the legs. A rigid leg from the top of the mast to the vertex of the triangular base supports the mast in that direction, while eight 2-inch cable guys from the top of the mast to the other corners of the triangle provide the side bracing. A boom 170 feet long with a 40-foot jib is attached at the bottom of the mast so that both mast and boom can be rotated by the bullwheel.

An American four-drum hoist powered by a Cummins diesel engine through a torque converter operates the derrick. All the drums are air-controlled. Three deck engines, one with a two-drum hoist and the others with single-drum hoists, provide motive power for the rig.

The subframe is carried on wheels which travel on a special track. On land, this track is laid on timber supports on the ground and the rig is pulled along on the track by cables attached to deadmen at both ends. For operating the derrick on water, sections of the track are extended out onto floats consisting of welded steel pontoons. The derrick is rolled onto the floats and securely tied down in place, and the track leading to the float is disconnected. Anchors are then set on both sides of the river upstream and downstream from the working location, and the deck engines maneuver the rig into any position.

By the close of the 1953 season the Elbowoods bridge had been completely dismantled, and the derrick was towed upstream by four sea mules equipped with Cummins 275-horsepower diesel engines and a 165-horsepower tug. Navigating the swift current amid the numerous shoals and sand bars was a treacherous job, but the trip was accomplished in 8 days. At the site of the New Town bridge, the derrick was landed on the right bank and rolled off the floats onto its land track, ready to start setting steel in the spring.

Steel erection

Beginning at the right abutment, the first span of the new bridge consists of a pair of deck girders with a span of 102.5 feet. Next are two three-span continuous deck trusses, each consisting of three 316-foot-long spans. These spans were all erected over dry land, the last truss landing on a pier at the edge of the river channel.

The next three spans over the main

Pounds Surfa-Sealz Pellets 3077 for One Ton Mix			
Rubber Hydrocarbon	Binder Content		
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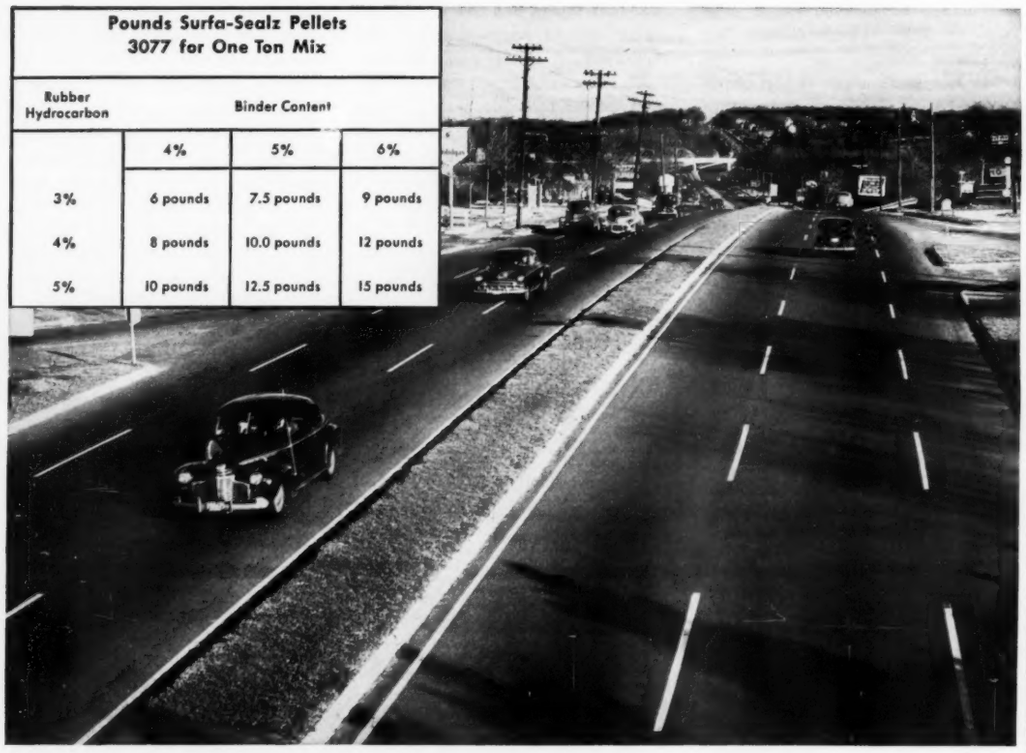
3%	6 pounds	7.5 pounds	9 pounds
4%	8 pounds	10.0 pounds	12 pounds
5%	10 pounds	12.5 pounds	15 pounds



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Surfa-SEALZ Pellets now make every hot mix plant in the country a potential rubber-bituminous mix plant, and with no special equipment required. Let's start NOW to cover America's highways with rubber-bituminous concrete!

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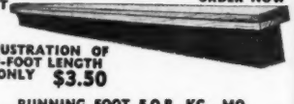

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CONTRACTORS AND ENGINEERS

channel of the river are the three continuous through-truss spans from the Elbowoods bridge. Where the rivets had been cut out in dismantling the bridge, the sections were built up by welding and then reamed and ground to original size. Where there was sufficient material, the holes were reamed for larger rivets. Sections which required strengthening to meet the H-15 design standards were built up with extra plates and angles. All sections were thoroughly cleaned and carefully inspected, and bare spots touched up with primer.

To the left of these trusses there was another three-span continuous deck truss similar to those on the right end, with a deck girder spanning from the final pier to the left abutment.

Beasley kept the falsework for the steel erection at an absolute minimum by using special telescoping falsework bents which were adjustable to practically any height and could be quickly and easily moved and reset. Each of these falsework bents consisted of two latticed angle columns for legs, braced with diagonal rods fitted with turnbuckles and separated by latticed angle struts. The lower section had telescoping legs which could be adjusted to any height from 27.5 to 39 feet. Each telescopic leg was equipped with one 150-ton hydraulic jack seated within section and used for final adjustment. Additional non-telescoping sections were added to bring the bents to a maximum height of nearly 100 feet.

Bases were attached to the legs of the bents with large pins to avoid the possibility of any bending moments being introduced. On land, the bases were set on timber sills; in the water, steel H-piles were driven to provide bearing. Cables strung between the tops of the piers provided longitudinal support for the falsework bents until the steel trusses were in place.

Steel was handled on the ground, and when necessary was loaded onto barges by a Koehring 1005 crane. The big derrick picked the truss members off the barges and raised them into position, where they were pinned and bolted in place by assembly crews. Riveting crews followed, making the permanent connections. Since the bridge deck is approximately 100 feet above the water level, and some of the steel in the through trusses towers high above the deck, the derrick had to make lifts as high as 150 feet to set some of the top chord members.

Just outside the main river channel on the left side the water was too shallow for the floats of the derrick, and there were several sandbars and islands which projected above the surface. Rather than operate partly afloat and partly on land, Beasley improvised a 12-inch hydraulic dredge and cut a channel across the shallows and islands all the way to the left bank. This not only made it possible to float the derrick, but permitted the delivery of all the steel to the derrick by barge.

Concrete deck

As soon as the deck trusses at the right end were completed, Maxwell Bridge Co. crews began forming for the concrete deck. The deck consists of a roadway 20 feet wide, with curbs 20 inches wide on both sides. Steel railings will be erected on both sides. The concrete floor slab has a thickness of 7½ inches on the deck truss and girder sections and 7 inches on the through truss where the stringers are closer together.

(*Concluded on next page*)

This view from the upstream side of the bridge shows Beasley's big amphibious derrick setting steel.

PHOTO COURTESY WORTHINGTON CORPORATION, HARRISON, N.J.

Chrysler High-Speed Power and Fluid-Coupling protection ready this mixer for big season ahead

"Guestimates" differ as to how big a year lies ahead in building. But we do know that public projects, commercial and home construction will set records in practically every part of the country. And from that we can logically assume that transit mix truck operators will be among the busiest people in the nation.

By the same token, engines powering transit mixers must deliver top-performance on a scale never before approached. Wear and tear on engines, transmissions and equipment will be tremendous . . . "down time" will be avoided like the plague. Most manufacturers have wisely prepared equipment for sustained top performance. They have powered with power-proved Chrysler Industrial Engines and are ready for the big job ahead.

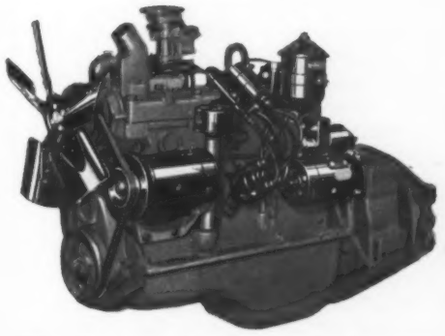
Pictured here is the Worthington Model LO 4½ Yd. Transit Mixer equipped with stationary hopper pouring footing for a commercial building in Ohio. While the compact Chrysler Ind. 30 Engine is placed immediately behind truck cab, drum rotation and drum speed may be controlled from either end of running board. This model is designed for fast charging and discharging.

Between the Chrysler Ind. 30, 230 cubic inch displacement engine, and the Worthington heavy-duty single lever operating transmission is a Chrysler gyrol Fluid Coupling. In this way Worthington protects driving and driven members from wear and tear imposed by shock loads, adds materially to clutch and transmission life.

When lightweight, high-speed, high-output power in a small, compact engine is indicated, check the Chrysler Industrial Engine Line, 230 to 413 cubic inch displacement. And remember, Chrysler Industrial Engines are not expensive. Production-line methods adapted to specialized industrial engine building provide custom-built engines at mass-production prices.

See a Chrysler Industrial Engine Dealer or write: ***Dept. 117, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER INDUSTRIAL 30 ENGINE
—230 CUBIC INCH DISPLACEMENT



CHRYSLER *Industrial Engines*

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER WITH A PEDIGREE

AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELD

(Continued from preceding page)

Forms were supported on 2×8 joists suspended from the steel on Superior hanger frames, and the overhanging portion on each side of the deck trusses rested on 6×6 needle beams clamped to the bottom of the top chord of the truss. Sheets of ¾-inch Plyform constitute the deck.

Concrete was batched from a Winslow Binanbatch to two Smith 3-yard mixers mounted on Ford trucks. These rigs mixed the concrete and delivered it to the hopper of a Rex Pumpcrete which pumped the mix to the forms. As the work progressed, the Pumpcrete was moved out on the deck so the concrete never had to be pumped more than about 500 feet.

A Jackson electric vibrator powered by a Jackson generator consolidated the concrete as it was placed. The slab was shaped by a steel strike-off pulled by a Tulsa winch and finished by hand. Curbs were finished by hand. Flat surfaces were cured for 14 days with curing pads soaked with water. Vertical surfaces were sprayed with membrane curing compound.

Aggregates for concrete were secured from nearby glacial deposits. The raw material was crushed, screened, and washed to produce clean aggregates of the required grading. Mixing water was obtained from the Missouri River, but some of the suspended solids were allowed to settle out before the water was trucked to the mixers.

Approximately 25 per cent of the 2,200 cubic yards of concrete in the deck was poured last season. With this start and barring unusual conditions, the deck will be ready for traffic by the fall of this year.

Painting of the structural steel, sublet to Chicago Decorating Co., Chicago, Ill., has progressed continuously since the first steel was erected, except for the winter season. All exposed structural steel receives three coats of paint—primer, intermediate, and finish. Painting will probably be completed in July of 1956.

Personnel

General superintendent for the construction of the bridge superstructure is Quay Franklin of Manhattan Construction Co. Superintendent for John F. Beasley Construction Co. was D. J. Hewett, and Beasley's project engineer was Marvin Kyger. Concrete work by The Maxwell Bridge Co. was supervised by Frank Cox.

Resident engineer for the Corps of Engineers on the Sanish relocation projects is Alvin L. Heald. In addition to the highway bridge, these projects include town-site relocations, railroad relocation, reservoir clearing, and bridge approaches. Tom Williams supervised the erection of the new steel and construction of the concrete deck. Salvage, reworking, and erection of the re-used steel, as well as bridge painting, were supervised by John Hedges. Harlan Hutchins is chief of the construction division and Col. Henry L. Hille, Jr., is district engineer of the Garrison district.

THE END

New steam cleaners

■ Its new series of high-volume steam cleaners features efficient heat exchangers and powerful pumping systems, according to Kelite Products, Inc., 1250 N. Main St., Los Angeles 12, Calif. The Model K line of gas or oil-fired cleaners, offered in capacities up to 300 gph, includes Super Duty models that deliver up to 3,000 gph.

The Kelite heat exchanger raises the water temperature to 100 degrees before the water enters the main heating circuit. It is emphasized that this is accomplished by trapping waste heat, thereby reducing fuel consumption.

The automotive-type piston pump runs in oil and has stainless-steel ball check valves to provide high-volume output. Another device automatically maintains the strength of the cleaning solution at the desired pH.

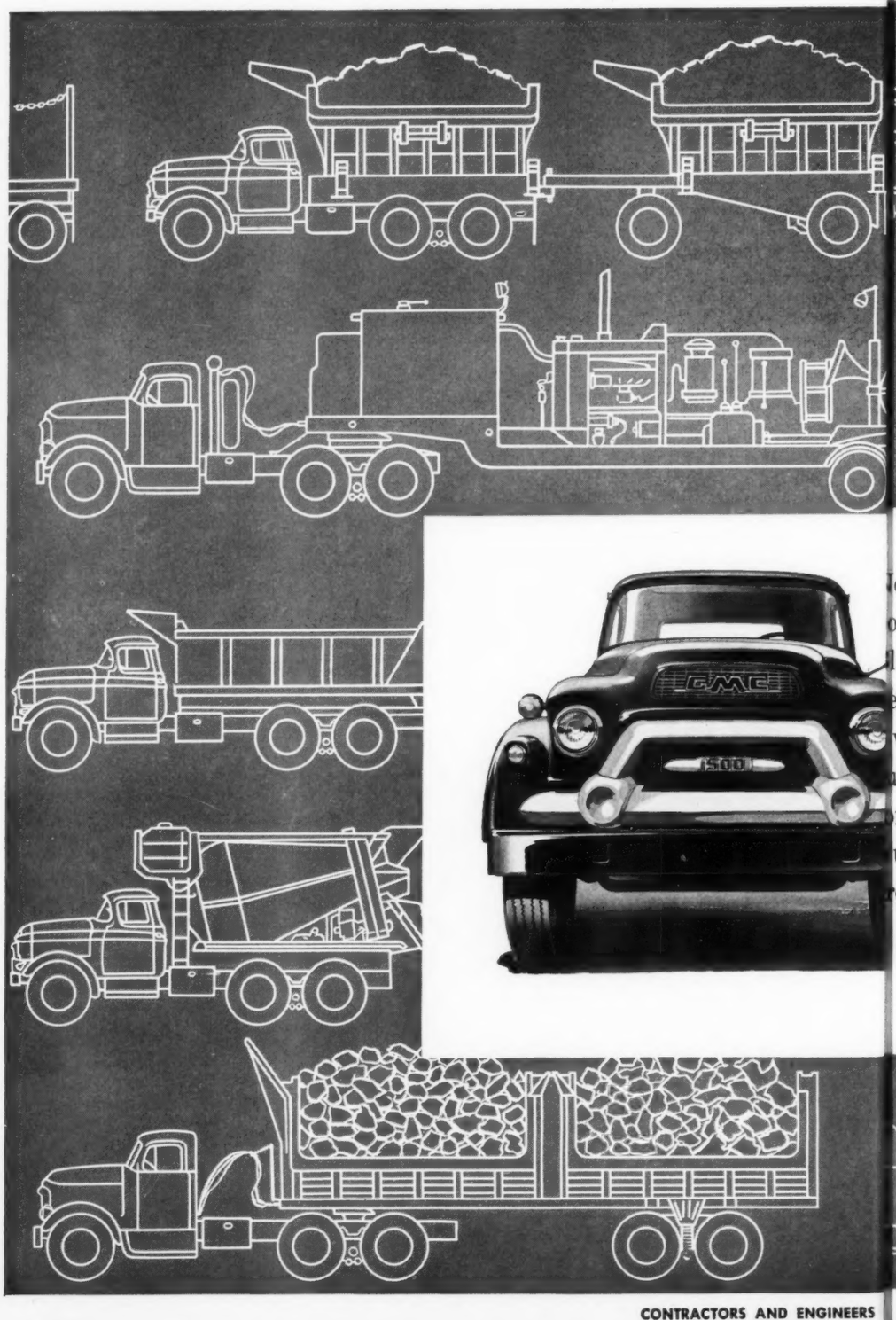
The new Model K Kelite steam cleaner.

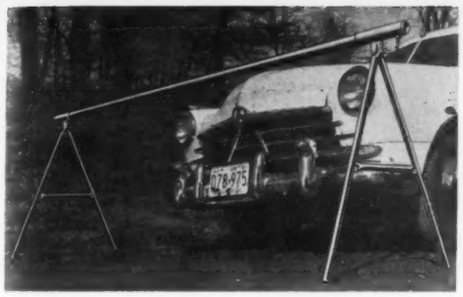
For further information write to the company, or use the Request Card at page 18. Circle No. 322.

Leschen Wire Rope news

The new district sales manager for Leschen Wire Rope Division of H. K. Porter Co., St. Louis, Mo., is Ted W. Peterson. Mr. Peterson will cover the states of Minnesota, Wisconsin, and North Dakota, as well as eastern Iowa and the upper peninsula of Michigan.

At the same time, Leschen announced that the New York district office and warehouse has moved from New York City to 219 Emmet Street, Newark, N. J.





The all-steel Bear-I Cade road barrier is easy to transport and set up.

Tubular-steel barricade is lightweight, easy to store

■ A new all-steel road barricade is now being manufactured by Utility Service Co., Inc., 1640 13th St., Racine, Wis.

Light in weight, the Bear-I-Cade is easy to store, transport, and set up. Eight-foot sections may be joined to form solid barricades of unlimited length.

The finish is long-lasting Rust-Oleum, available in a choice of colors. Convenient lantern hooks are provided on both ends of each eight-foot unit. The entire unit is made of heavy-weight steel tubing, welded at all joints.

For further information write to the company, or use the Request Card at page 18. Circle No. 323.

Energy Farm Equipment Co. acquires grader line

Manufacture of the Husky all-purpose grader, formerly made by The Northfield Iron Co., Northfield, Minn., has been assumed by the Energy Farm Equipment Co., Monticello, Iowa.

Energy Farm Equipment Co. will continue to manufacture its present line of hydraulic and farm machinery.

The Beaver No. 20 Speed-Cut machine features a foot-controlled chain vise that holds irregular material in place while it is cut.

Metal-cutting machine handles many shapes

■ A new abrasive cutting machine now being marketed by Beaver Pipe Tools, Inc., Warren, Ohio, cuts through soft or hard metals, leaving a smooth surface that seldom needs reworking. The manufacturer also claims that the Speed-Cut abrasive cutting machine will cut metal of a variety of shapes and sizes efficiently, including thin-walled tubing, soil pipe, galvanized steel, angles, structural members, or solid bars.

The machine is available in two models. On the No. 20 a foot-controlled chain vise holds both standard or irregular shapes securely during the cutting operation. The No. 14 has a hand-operated chain vise.

With a 20-inch cutting wheel, the No. 20 can sever a 6-inch pipe or a 2½-inch solid rod or bar at a wheel speed of 2,300 rpm. The No. 14, using a 14-inch wheel and a wheel speed of 3,000 rpm, can cut 4-inch pipe or a piece of 2-inch solid bar or rod.

For further information write to the company, or use the Request Card at page 18. Circle No. 324.

Data on walking draglines of single-deck design

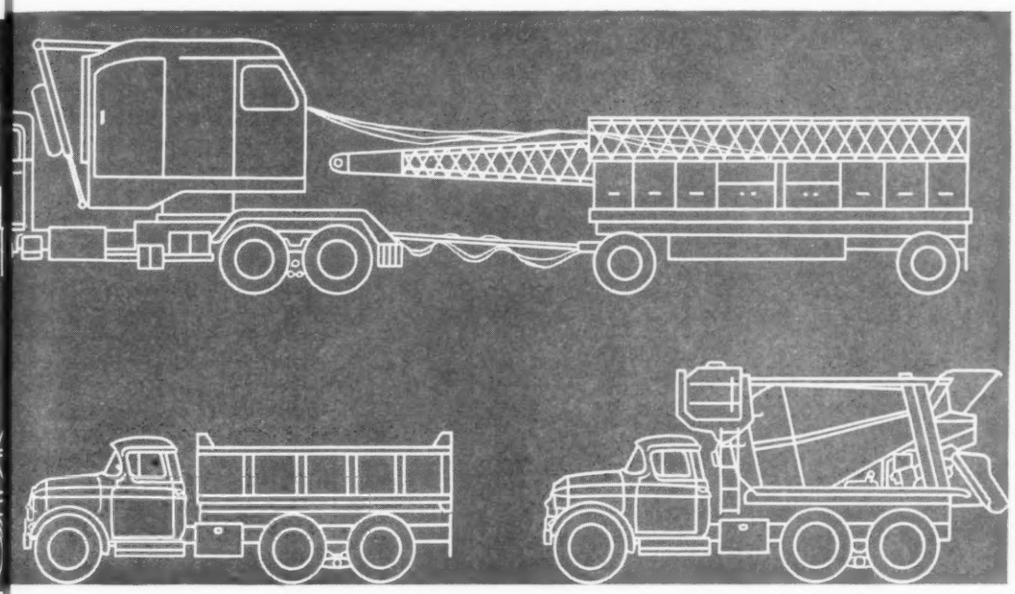
■ A catalog covering the entire line of Page single-deck walking dragline machines is now available.

Describing draglines ranging in capacity from 5 to 15 cubic yards, the literature stresses the fast economical operation of the machines. Each working mechanism, its function, features, and capabilities are discussed in detail.

Specifications given for each model cover boom length; bucket capacity; maximum load capacity; hoist-line speed; engine bore, stroke, and horsepower; and working weight.

Photographs illustrate several types of dragline operations. One section, devoted entirely to ease and convenience of maintenance, shows the advantages of the large working space that has been provided on the machines.

To obtain Catalog No. WDSD-155 write to Page Engineering Co., Clearing Post Office, Chicago 38, Ill., or use the Request Card at page 18. Circle No. 301.



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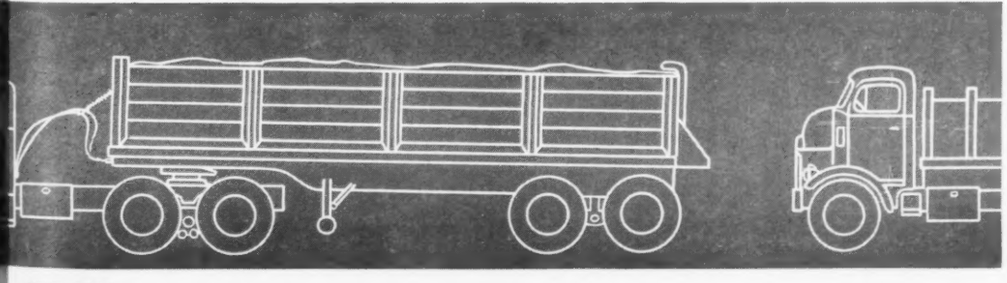
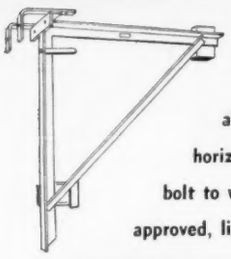
GMC TRUCK & COACH—*A General Motors Division*



SUPERIOR WALER JACKS

A Must ON CONCRETE JOBS



Fast . . . safe . . . no sway!

Low cost, ruggedly built Waler Jack provides solid scaffolding on bridges, dams, abutments—all concrete construction jobs using horizontal walers. Use on 2 x 4 or 2 x 6 waler—or bolt to wall. Can be used on bottom waler. State approved, light weight—a real moneymaker!

FREE TRIAL ON YOUR JOB! | *Write for Descriptive Literature To Nearest Address*

Dealer Inquiries Invited

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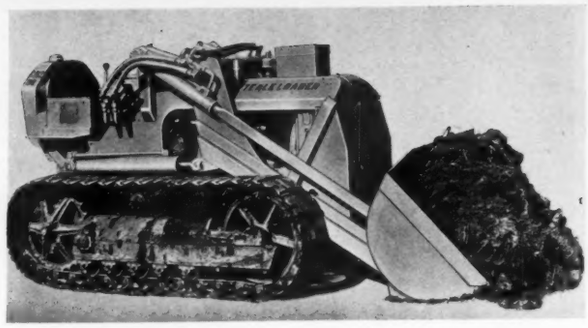
NATIONAL PLASTER BLOCK CO.
Dept. CE
2236 N. 27th St., Philadelphia 32, Pa.



The Teale TL-20 loader for Caterpillar D2 tractors digs up to 3,000 pounds of material and lifts it up to 9 feet high in 6 seconds.

Loader for small tractor has fast lifting speed

■ Specially designed for Caterpillar D2 tractors with non-oscillating track frames, the new fully-hydraulic Teale TL-20 loader combines a fast lift speed with good maneuverability.

Simple in design, the inside-mounted loader is built to offer unusual durability, according to the manufacturer. All hinge points are zerk-lubricated and are fitted with heavy-duty oversize pins and replaceable bushings. The hydraulic system, including Hydreco valves, permits continuous high-speed operation.

The TL-20 lifts ¾ yard of material to a clearance of 9 feet measured at the bucket hinge points. With breakaway power at ground level of 5,000 pounds, and 3,000 pounds of lifting capacity, the machine digs and lifts material to full lifting height in 6 seconds.

Teale attachments for the TL-20 include rock bucket, light-materials bucket, sidewalk snowplow, lumber fork, scarifier, and rippers.

For further information write to Teale & Co., 1415 N. 52nd St., Omaha 2, Nebr., or use the Request Card at page 18. Circle No. 325.

Units spray materials direct from shipping drum

■ The versatility of Tarco sprayers is illustrated in a new folder from Tarrant Mfg. Co., 27 Jumel Place, Saratoga Springs, N. Y. These sprayers can handle such diverse materials as bituminous binders, concrete-curing agents, waterproofers, and weed killers. The literature also emphasizes design advantages which permit materials to be sprayed directly from the shipping drum.

The wheel-mounted sprayers come complete with an air compressor and a single-cylinder four-cycle engine mounted on a pressed-steel base. Built with a frame of heavy channel iron, they carry regular steel shipping drums of material in a cradle-like frame. Two automatic safety valves regulate air pressure at 32 pounds.

Equipment for the sprayers includes a 16½-foot length of abrasion-resistant hose, a 4½-foot double-offset spray pipe, an extra screen, a bung wrench, six different spray nozzles, and a canvas engine cover. A special tank attachment is available for warming heavier bituminous materials.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 241.

Look at the Record

and you'll look to AUTOCAR for . . .

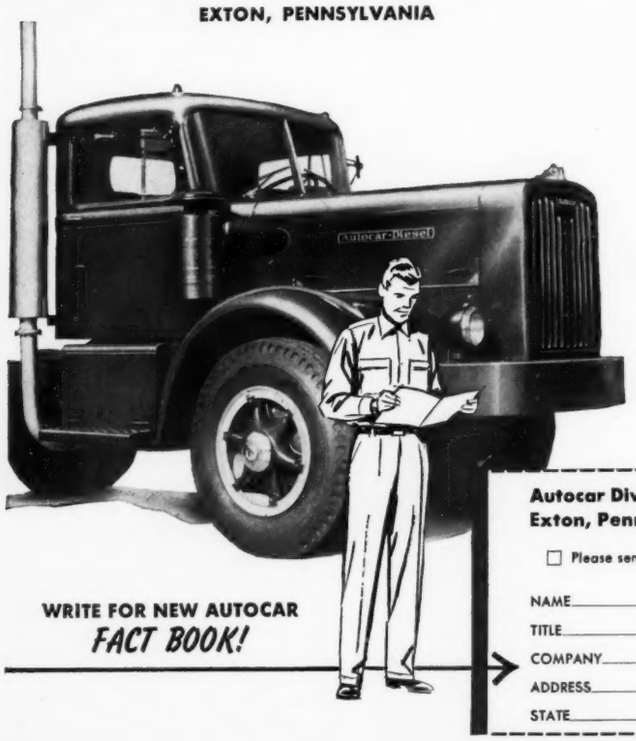
COMPARE these features, and you'll pick Autocar every time!

It's heavier-gage sheet metal than used on most other makes, but, more than that, there is extra care given Autocar sheet metal because of the *duridizing* process that produces on the cleaned metal surface a thin, hard chemical coating that increases paint life . . . resists corrosion and wear . . . provides a firm anchor for baked-on paint.

- **AUTOCAR NUT AND BOLT CONSTRUCTION**—Greater strength . . . permanent, tight fit . . . easy, quick maintenance.
- **BALANCED DRIVING ASSEMBLY**—Stops vibration troubles before they start.
- **RENEWABLE BUSHINGS AT CRITICAL WEAR POINTS**—Easier and more economical to replace bushings instead of larger, more costly parts.
- **AUTOCAR "DRIVER" CAB**—Sky-scraper construction, rigid and reinforced, makes it the safest, longest-lasting cab on the road.
- **DOUBLE REDUCTION GEAR**—Two matched pinions and two gears for greater strength, smoother, more efficient power.
- **RUGGED AUTOCAR FRAME**—Heat-treated alloy steel rails flex and spring under stress yet they're rugged and rigid for tough shock and rough going.
- **AUTOCAR SHEET METAL LASTS LONGER**—Heavier gauge sheet metal with special coating process really stands up . . . for more years.
- **AUTOCAR CUSTOM BUILDING**—Widest choice of high-quality components enables you to tailor the Autocar to your exact work.

AUTOCAR TRUCKS

AUTOCAR DIVISION OF THE WHITE MOTOR COMPANY, EXTON, PENNSYLVANIA



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Autocar Division of The White Motor Company, Exton, Pennsylvania

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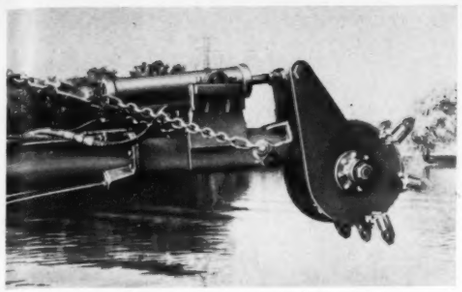


The Pfarrer Agipeller, a new suction dredge agitator.

Suction dredge agitator has simplified design

■ A suction dredge agitator made by W. H. Pfarrer Co., 211 W. Wacker Drive, Chicago, Ill., is designed to increase dredging output and to reduce downtime due to clogging of the nozzle. The Agipeller is a simple, but powerful oscillating agitator activated by hydraulic power from the deck of the dredge. It eliminates the heavy weights, long shafting, bearings, coupling, chains, and pins associated with conventional ladders.

Rows of manganese-steel teeth sweep back and forth in front of the suction nozzle, cutting and loosening compacted deposits and pushing aside large objects to keep the nozzle clear. Should tramp iron or any other obstruction become wedged in the nozzle, the Agipeller automatically reverses itself to avoid damage.

This equipment is specifically recommended for use in sand and gravel deposits which do not cave readily, or for loose deposits containing a large number of oversized stones that clog plain suction nozzles and their dredge pumps.

The hydraulic pump of the power unit may be either direct-connected to a motor, or run off a jack shaft by V-Belt drive.

For further information write to the company, or use the Request Card at page 18. Circle No. 326.

Diagrams explain diesel-engine combustion

■ A booklet that explains the operating advantages of the "cushioned power" combustion chamber design of Continental diesel engines is available on request. The combustion chamber on these engines consists of two connected compartments. This design is said to promote thorough mixture of the fuel spray with the super-heated air in the cylinder, making for complete combustion.

A series of cutaway photos illustrates the entire operating cycle of the diesels from intake through exhaust. A graph indicates the pressure generated in the cylinders and on the pistons at each stage in the cycle, and compares it with that of other diesel engines.

Brief specifications are listed for Continental diesel engines ranging from 39 hp at 2,000 rpm to 225 hp at 2,200 rpm.

To obtain Form DB-54 write to Continental Motors Corp., Muskegon, Mich., or use the Request Card that is bound in at page 18. Circle No. 297.

Masonry cutting blade has long service life

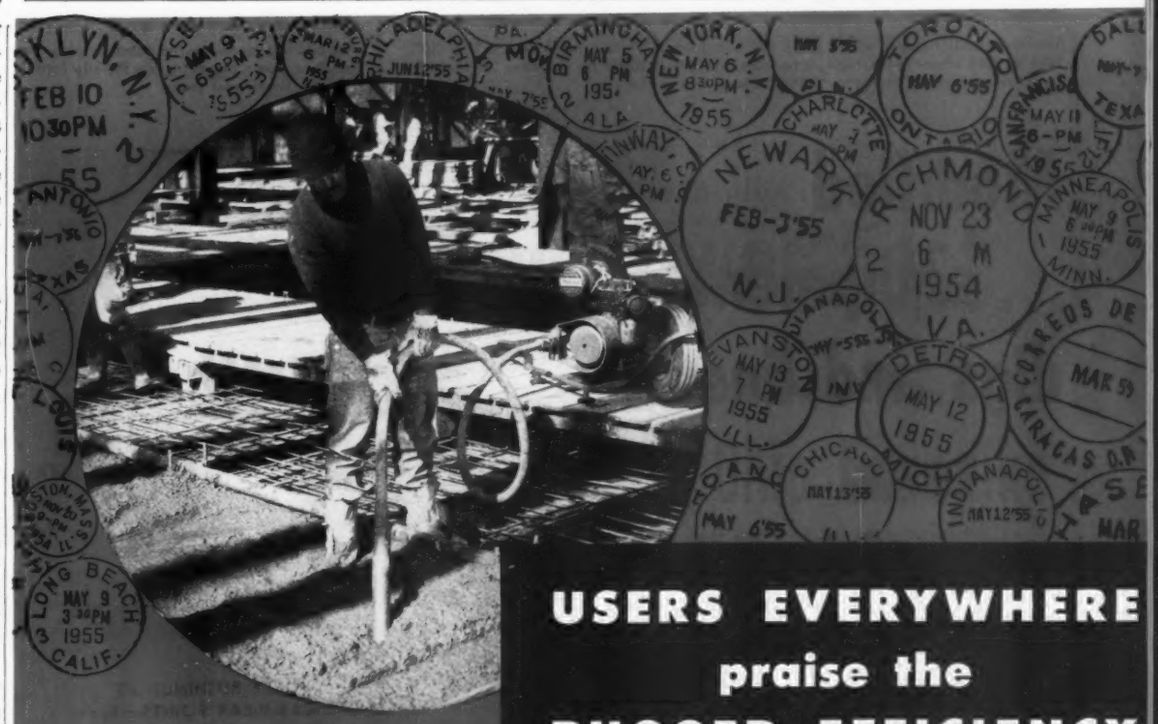
■ A masonry-cutting diamond blade reported to have a service life one-third greater than that of standard blades is illustrated in a bulletin from Cardinal Engineering Corp., Philadelphia 27, Pa. The blade will cut concrete, brick, tile, refractory, and other hard masonry materials.

Available in 12, 14, and 16-inch sizes, the blade is made for wet cutting use on any standard type of masonry saw. Each diamond-bearing segment of the blade is individually molded to obtain uniformity in the distribution of diamond content. The blade is hardened, tempered, and tensioned to proper operating speed.

To obtain Bulletin P-10 write to the company, or use the Request Card at page 18. Circle No. 246.

Syntron names salesman

R. S. Price has been appointed to the sales staff of Syntron Baltimore Sales Co., district representatives for Syntron vibratory equipment, conveyors, feeders, and power tools, in the Baltimore area. Mr. Price will make his headquarters in the Baltimore, Md., office.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DETROIT MAY 12 1955
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USERS EVERYWHERE praise the RUGGED EFFICIENCY of Whiteman Vibrators

CHICAGO REPORTS:
"We are more than satisfied with our Whiteman Vibrator. Does more thorough job than we thought possible."

RICHMOND SAYS:
"Your machine sure has got everything it takes. It's doing a fine job and hasn't given us a bit of trouble."

MIAMI WRITES:
"You'll be happy to know that we consider this the best vibrator we've ever owned. It's got lots of extra power and sure is built to stand up."

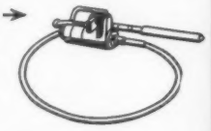
LOS ANGELES REPORTS:
"We figured Whiteman would come out with something good, but this machine tops them all. Congratulations!"

From Coast to Coast come enthusiastic reports of the superior performance of Whiteman Vibrators. Contractors have found everything they expected in these machines, engineered and built by Whiteman, the leader in concrete equipment . . . rugged stamina, highest efficiency and complete dependability. A model for every job requirement. Before you buy any vibrator, be sure to see the great Whiteman line.

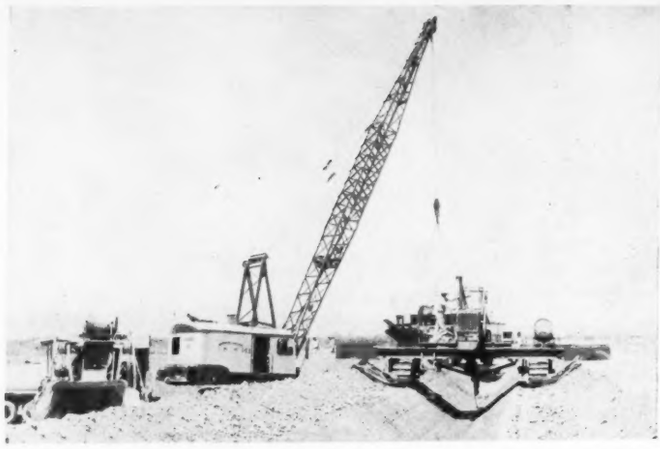
MODEL GW → with wheelbarrow base. For heavy duty work. Reliable 6 HP Wisconsin engine. 9,000 VPM.

MODEL SW → with swivel base. For use on average jobs. 2½ HP Briggs & Stratton engine. 4,000 VPM.

MODEL EW → features new, highly efficient Whiteman electric motor with centrifugal blower cooling system. 9,000 VPM.



The shop-built tugger, which pulls the slip form with a Braden winch and 400 feet of Bethlehem wire rope, straddles the small ditch on Buckeye wide-gage trencher tracks. A Caterpillar D8800 diesel drives the rig.



At a sharp corner in the canal system, the self-propelled tugger turns in the canal under its own power, while the slip form is picked up and moved to a new position by the Northwest crane.

Modified equipment digs and lines canal swiftly

(Additional photo on front cover)

This modified Buckeye trencher makes one pass to excavate 2-foot-bottom-width canal

by RAY DAY

To pave 3,000 linear feet of canal daily for one of the last sections of Arizona's Gila project—and a mile of canal on peak days—Morrison-Knudsen Co. Inc., Boise, Idaho, is using some unconventional equipment. Spread over a 64-mile area around Wellton in the southwestern part of the state, this work on small laterals at the end of the main system represents the toughest type of canal construction. Builders prefer to construct big ditches—hydraulic arteries with bottom widths of 16, 20, 30, or even 48 feet.

The small canals, in addition to being rough to excavate, also present a water-supply problem. A 1.5-cubic-yard batch of concrete is enough to line 22 feet of the small canal section, and 100 batches is enough to carry equipment 2,200 feet along the canal route. Water, scarce in this area for concrete mixing and embankment compaction, has to be supplied to the paving train as it moves along.

The present work on the system is being done by Morrison-Knudsen under three U. S. Bureau of Reclamation contracts totaling about $2,600,000. Not new to this work, M-K has completed 137 miles of canals and laterals under five principal contracts for the Gila project during the last five years. The first of its current contracts is for a 26-mile lateral system known as Wellton No. 2. With the exception of 2,000 feet of lateral canal with a bottom width of 5 feet and side slopes of 1¼ to 1, the canals have a 2-foot

As a dry batch is dumped from a truck to the Koehring 34-E Twinbatch paver, a crane places concrete in the slip-form liner made by the Conveyor Co.

Sealtex curing solution is sprayed onto the lining immediately after the slip form goes by.

bottom width with 1¼ to 1 side slopes. All the canals range from 1¾ to 5 feet deep.

Other contracts on the project include the 18-mile Dome No. 2 schedule, begun last November, which covers work on canals 2 feet wide at the bottom. A 21-mile project also begun last November is Mohawk No. 4, which has canals with a 2-foot bottom width ranging in depth from 1¾ to 4½ feet.

Limited working space

The small canals on this job are located far out at the end of the irrigation system where, in order to maintain elevation so that water can reach agricultural areas, the canals are being built with raised sections. Though the crests of these built-up embankments are only 14 feet wide, there is scarcely any maneuvering room at the site for the DW21's and other equipment putting up the dirt work.

Since many parts of the lateral system are several feet below the desired hydraulic gradient of the ditch bottom, the U. S. Bureau of Reclamation engineers called for about 1,000-000 cubic yards of earth to be moved for building up the necessary core bank in which the canal is being constructed. About 550,000 cubic yards of additional earthwork is needed for dikes and levees. Most of this is short-haul excavation, calling for only a limited amount of ripping. Density requirements on the core bank needed plenty of water for pre-blending so that specified densities could be developed.

M-K used water from the main-line Wellton-Mohawk canal whenever possible, but arrangements were made to obtain water from farmers owning wells where the lateral system was too far from the main canal. In at least a dozen cases, M-K hired Yuma Well Drilling & Pump Co. to sink 16-inch cased wells 125 feet into the ground to get needed water.

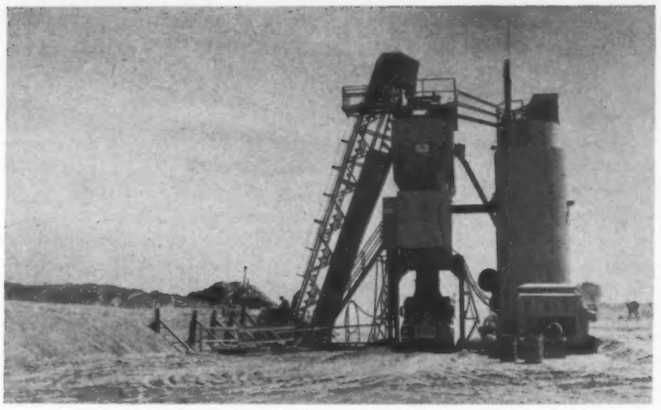
The initial earthmoving work was done by the twelve D8 tractors and seven Wooldridge scrapers which form the backbone of the company's fleet. Other units on the job included eight more Cat D8 tractors, five DW21's, two Southwest sheepsfoot rollers, several 4,500-gallon water transports mounted on heavy-duty frames behind Euclid units, and ripping and motor-grader equipment.

An extensive amount of pre-wetting was done in borrow areas, and virtually all pits were diked with loose material by a Caterpillar D8 with dozer about three weeks before the dirt-moving equipment moved in. Water was either hauled or pumped to these areas to dampen the earth as much as possible before it went into the embankments. This not only did away with the manipulation of material as it went into the fill, but eliminated a possible dust problem while the material was being dug.

Canal excavation

Conventional equipment, previously adapted to canal excavation by M-K and used by the company for some of the small canals on the Gila project two years ago, (see "Twenty-Mile Canal Job Completed in Two Months", C&E, October, 1953, pg. 92) is being used on the present job. One of the machines is a Buckeye 51 trencher, adapted to this type of canal work for M-K two years ago by the Gar Wood Co. The rig has a prism-shaped cutter with side wings capable of cutting 1¼ to 1 sideslopes rather than the vertical sideslopes normally excavated by the machine. The weight of the cutter rides on a bottom shoe with splayed wings. These reach part way up the slopes, thus spreading the weight of the ma-

(Continued on next page)



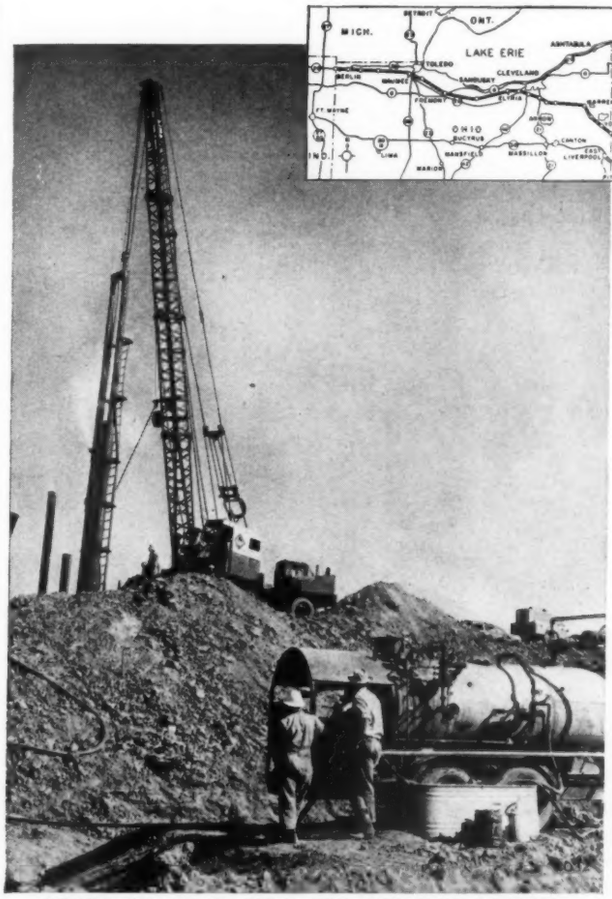
A GMC truck is loaded with 1½-cubic-yard batches at the Conveyco plant. The portable batch plant is quickly and easily moved from place to place to keep hauls as short as possible in the 64 miles of canal work.

Another Cleaver-Brooks Mobile Boiler in action:

Portable steam proves best...

for pile driving on

Ohio Turnpike



BOILER CAN BE SET UP A FEW FEET FROM HAMMER
Keeps steam lines short . . . assures constant pressure for smooth, powerful hammer action. Operation is clean, smokeless.

THE Ohio Turnpike is making headline news because contractors are using up-to-the-minute methods across the board. And portable steam, furnished by Cleaver-Brooks boilers, is winning acclaim. It *guarantees the most practical, economical way* to drive piles for many of the 282 scattered structures along the way. Here's why:

Goes anywhere wheels can roll — No trailer expenses. Tows to any site. Built for "rough and tumble" service.

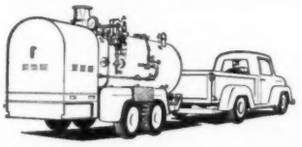
Fast hook-up — Standard fittings for steam, water and fuel. Gasoline-engine or electric powered. Light-oil fired. All-weather protected. Carries own fuel oil supply.

Fast steaming — Full head of steam in 30 minutes or less from a cold start. Constant steam pressure through automatic low and high fire operation. Nationally-known safety and operating controls are standard.

Fuel-saving 80% efficiency — Guaranteed 80% efficiency from full load down to 30% of rating. Guaranteed better than 99% dry steam under actual test.

No special operator needed — Cleaver-Brooks provides initial starting service — also trains operator in maintenance.

"GO-ANYWHERE HANDYMAN" KEEPS BUSY ON SCORES OF ALL-YEAR JOBS



Built with the famed Four-Pass High Efficiency Design by the originators of the self-contained boiler

Two models are available: 80 and 125 hp, 150 lbs. working pressure, trailer or skid-mounted. You'll find wide usage for extracting, asphalt plant, ready-mix, winter concrete operations, thawing and miscellaneous heating. Write for a copy of Catalog RM-108. Cleaver-Brooks Co., Dept. H-397 E. Keefe Ave , Milwaukee 12, Wis.

Cleaver Brooks

A CMC pump brings mixing water to one of the trailer tanks serving the paver. When the spread worked too far from a canal, water was secured from nearby farm wells or specially drilled wells.

chine over a larger area. Discharge conveyors are arranged so that about half the dirt excavated is dumped to either side of the canal. Only one pass is needed to dig the canal to its required bottom width of 2 feet, and to its required depth.

The 2,000-foot-long ditch of the Wellton No. 2 unit was also dug with the machine, even though this canal has a bottom width of 5 feet—more than double the width of the other canals. The equipment, combined with one of the two Gradalls used on various parts of the project for structure excavation, made two passes to complete this section.

As fast as the Buckeye trenching machine made an initial pass up one side of the 2,000-foot canal, a dozer shoved the excavated dirt back into the cut. The machine then moved to the opposite side of the canal and cut the bank to its precise trimmed line, tossing dirt outside the canal line in the usual manner. The Gradall made a final pass to pick out all the loose dirt remaining in the uncut triangular bank in the center of the canal. Both slopes were preserved and, despite the secondary handling of material, this part of the job was done swiftly and at a reasonable cost.

High paving speed

The 2-inch concrete canal lining is being placed on a 3,000-foot-per-8-hour-day basis, and higher production is being achieved on long sustained runs. These are few, however, since this job, like other lateral canal systems, has runs broken up by small structures. About 1,200 structures—some of which will be precast and set into place later—are called for on M-K's three contracts.

Sand and aggregate for the concrete mix is being produced near Wellton under a separate contract, and delivered by truck to the batch plant. The Conveyco portable plant, which has been used at three sites on this job, is capable of being moved from place to place in a hurry. On a recent move, a crew worked three days for a total of 30 actual hours to take the equipment down, move it about seven miles, and set it up again. The 1½-cubic-yard batches being turned out by this plant are hauled to the job by a fleet of GMC 3 and 5-batch trucks.

Mixing and placing of the concrete lining starts conventionally with trucks backing to the Koehring 34-E Twinbatch paver and dumping as soon as their back wheels hit stop blocks welded in the paver skip. A Northwest 95 crane with 50-foot boom handles a Gar-Bro 2-yard concrete bucket, which has a quadrant removed from one side to give it the necessary clearance under the discharge throat of the paver.

A 3,000-gallon water-tank trailer, mounted on 12 rubber tires for easy traction in the sand, pumps water to the paver by means of twin Wisconsin-driven CMC pumps. A delivery hose runs from the trailer to a special 4-inch steel pipe carried under the frame of the crane, then to the paver. This makes water constantly available to the train, though there is not room between the crane and the paver for a water carrier.

The equipment string also includes a John Deere flat-bed trailer, which normally carries barrels of Sealtex curing solution, Durair air-entraining agent, and other materials. A jeep carries drums of Sealtex white-pigmented curing solution, as well as compressor and spray equipment; and a 2,500-gallon FWD truck unit has a Gorman-Rupp 3-inch high-output pump for transferring water between this unit and the towed trailer.

Slip-form liner

Lining is done by two machines—a small slip form through which ma-

Biggest tractor news in years..

Twin Engines—
365 h.p. delivered
to power train

Unequalled Power...Smoother Operation

Here's a completely new concept of crawler tractor design and performance . . . the new TC-12 Twin-Power Euclid. It's designed and built to give you all the features you want in a tractor—more power, easy operation, greater workability and accessibility for servicing . . . and all of the power train components are matched, with years of application in earth moving equipment.

Powered by two diesels with separate Torqmatic Drives for each track, the TC-12 has 365 h.p. available for tractive effort — a smooth steady flow of power to meet any job requirement. There's no master clutch and no manual gear shifting . . . the operator simply moves a lever to select one of three speed ranges — forward and reverse — for travel speeds up to 8.3 m.p.h. Maximum drawbar pull is equal to, or greater than, the weight of the tractor and any attachments.

Each half of the tractor is separate and free to oscillate on a single transverse shaft. This gives the TC-12 maximum stability and traction on rough ground. The tractor can be easily separated into two halves for shipment when necessary.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Never before so much WORKABILITY!

terial is distributed, and a heavy-duty self-propelled tugger which pulls the slip form along. Made by Conveyor Co., Los Angeles, Calif., the slip form is like the Buckeye digging machine in that it rides directly on the bottom of the canal rather than on rails. Concrete is dumped from the Gar-Bro 2-yard bucket through the 12 distribution compartments of the slip form. Accurate spotting of the bucket over the slip form has been made easy by rigging a holdback line from the Northwest crane boom through a sheave on the Gar-Bro bucket, then back through the fairlead to the front drum of the crane.

Four small Viber external-type vibrators and a Quincy 25-cfm compressor for supplying air are carried on the slip form. The slip-form nose, which rides the bottom of the ditch, is shaped so that there is no distortion of the finished dirt work as the machine moves along.

The tugger which pulls the slip form along is an M-K shop-built rig. It has Buckeye wide-gage trencher tracks, capable of straddling a typical 2-foot-bottom ditch section, and is driven by a Caterpillar D8800 diesel engine. Its gear train consists of a Braden heavy-duty winch, equipped with 400 feet of Bethlehem ⅞-inch wire rope for pulling the slip form. On straightaway lining, this rig simply keeps as much as 450 feet ahead, then takes up the slack from the winch at a steady pace. The machine makes turns under its own power, while the slip form is picked up and moved to its new location by the Northwest.

The use of air-entrained concrete mix has kept vibration and placing difficulties to a minimum. The Durair air-entraining agent, dispensed from two drums mounted on top of the Koehring Twinbatch paver, gives about 4 to 5 per cent of air content in the mix.

Construction and expansion joints are being grooved 10 feet apart as the lining is placed. Four concrete finishers work just behind the slip form to put final touches on the concrete surface, and the grooves are cut by grooving tools mounted on long-handled floats.

The present work being done by M-K is part of the Wellton-Mohawk Division project, which includes canals, pumping plants, and structures needed to irrigate a 75,000-acre tract with water from the Colorado River. Work for this division has been underway for the past decade, and construction of the entire Gila project has been going on since 1930. When M-K completes its current three contracts, canal contracts will be left in only two more sections near the extreme east end of the project, about 50 miles from Yuma. These remaining lateral canals will be bid on this year.

General supervision of the work for Morrison-Knudsen is under J. E. Ricker. He is assisted by Bud Snowball, excavation superintendent; Neal Spencer, project engineer; Bill Burns, structures superintendent; and Charles Kincaid, field engineer. The project is being supervised and administered from the USBR regional office at Boulder City, Nevada. Local supervision is being handled by the Yuma district offices under the direction of Murray J. Miller, project engineer. THE END

New conveyor belts of synthetic fabrics have high tension ratings

■ Two new high-tension conveyor belts made of new synthetic fabrics have been announced by the Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass. Designed for use on long-center and high-lift installations, the High Load and Haul King belts offer the advantage of light weight with high strength. These new belts have working tension ratings up to 110 pounds per inch per ply.

Both belts are available with fabrics of either all rayon or chemically-treated cotton warp with nylon filler. The new belts have high-strength-to-gage ratios and high-strength-to-weight ratios, resulting in thinner and lighter construction than that possible with cotton duck belts with the identical number of plies. This design permits the belt to carry heavier loads on longer centers, and requires lower horsepower drives and smaller pulley diameters.

Fewer longitudinal carcass breaks from impact stress, greater transverse flexibility to give better troughing and training, and easier handling are among other advantages of these thinner synthetic belts. A reduction of stretch up to 25 per cent at working tensions, which reduces takeup and lowers maintenance costs, is another feature reported. The high-tension belts are said to have a flex life up to 5 times greater than that of conventional cotton belts.

For further information write to the company, or use the Request Card at page 18. Circle No. 312.

...e "Euc" TC-12 Twin Crawler

INDEPENDENT TRACK DRIVES

...lair trigger" control of steering at all times and in any ...eed range, forward or reverse, is a result of each track ...ving a separate power train. Spin turns, fast and tight, ...n be made by reversing one track and keeping the ...her in forward speed. Routine steering is done easily ...y putting one transmission lever into neutral and using ...e track brake. Fast, easy steering is one of the out...nding design and performance features of the ...uc" TC-12.

TORQMATIC DRIVES

...ch track is driven by a GM 6-71 diesel ...rough a separate Allison Torqmatic ...nverter and transmission. Shifting ...om one of the three speed ...nges to another can be done ...der full power with no loss of ...otion . . . the tractor can be shifted ...o reverse while moving forward so ...ere's no lost time for stopping and clutch...g. The power train of the TC-12 provides a ...eady flow of power that's matched to other equip...ent and job requirements.

TWIN ENGINES

With 365 h.p. delivered to the power train, the TC-12 has far more horsepower than any other "big" tractor . . . and the weight to use this power as tractive effort. It develops greater drawbar pull at faster travel speeds . . . a mighty important feature for work with rubber tired scrapers and other crawler applications. A top travel speed of 8.3 m.p.h. and faster speeds in the working ranges give the TC-12 a big advantage in workability.

EASE OF OPERATION

The power train of the TC-12 provides simple operation and a smooth flow of power. There is no master clutch . . . shifting from one of the three speed ranges to another is done under full power with no loss of momentum. There's no delay for stopping or clutching. Independent track drives gives this "Euc" fast, easy steering under all job conditions.

...on More Workability

...ADIATORS AT REAR

...ar location of the cooling system maintains ...fficient engine operating temperatures and ...ovides better front visibility for the operator. ...nged radiator hoods make it a simple matter to ...ange a fan belt or to service the radiator.

...CCESSIBILITY

...hitized assemblies are all easy to get at—they can be ...moved or serviced without tearing down other parts. ...ccessibility of all major components that can't be ...qualled in any other crawler—keeps downtime to a ...inimum. All lubrication fittings and check points are ...cated for easy servicing—fuel tanks have ample ...apacity for full shift operation.

SPECIFICATIONS

total h.p.—388 h.p. at rated speed
available for tractive effort—365 h.p.
speeds—3 speed ranges forward and reverse to 8.3 mph
drawbar pull (bare tractor)—forward and reverse—
54,000 lbs. low range
53,500 lbs. intermediate
53,000 lbs. high range

track width (standard shoe)	26"	track gauge	110"
overall width	11' 4"	overall length	16' 2"
height (excluding stacks)	7' 11"	drawbar height	23"
ground clearance	20"	operating weight (bare)	approx. 58,000 lbs.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

About 200 yards from the asphalt plant, this crushing and screening plant produces and blends mineral aggregate for the mix. Universal jaw and roll crushers and Pioneer and Simplicity double-deck shaker screens work in a closed circuit to produce 160 tons of 1-inch-minus material per hour.

Ray Day Photos

Relocation job hinges on adequate base, subbase

The artificial blending of materials to make an acceptable subbase and mineral filler for hot-mix paving was the most difficult problem encountered by Strong Co., Inc., Springville, Utah, in relocating a 9-mile stretch of U. S. 40 near Salt Lake City. Working with the only source of aggregate nearby, the contractor had to add 10 per cent of clean sand at the rock plant to bring the material's PI down to acceptable requirements. Additional blending, once the material was placed in windrows on the road, resulted in an excellent subbase job.

The new road replaces a crooked and dangerous section of U. S. 40 which rises into the Wasatch Mountains 35 miles east of Salt Lake City. Virtually all of the old 9-mile section was relocated under two separate contracts from the Utah State Road Commission. A $743,167 contract covered 5.74 miles of road, and a $347,295 contract covered slightly more than 3 miles of the stretch. Contracts for the two sections included grading, drainage, subbase, plant-mix apshalt paving, and an asphalt seal coat.

No seal or chips were used on the smaller job. The longer stretch has a plant-mix surface, 32 feet wide and 3 inches thick; a seal coat consisting of an application of 0.25 gallon of bituminous material per square yard; and 20 pounds per square yard of cover material, Type A, ½-inch-minus chips. The depth of the granular base course varies from 8 to 20 inches, depending on soil characteristics. Plans called for uniform subgrade densities with unit weights reaching about 90 per cent of the best compacted weights which can be developed in a laboratory.

The west end of the section makes a connection with U. S. 30-S, permitting traffic from Salt Lake City to Vernal and the east to enter the road without stopping. Limited access has been achieved by locating a cedar post and barbed-wire fence along both sides of the 120-foot right-of-way.

AN OUTSTANDING TEAM

for Ditching, Digging

INTRODUCING
Allis-Chalmers
WD-45 Wheel Tractor
with Henry Backhoe

Whether it's digging ditches, trenches, culverts, footings or foundations, you'll find this team's power, mobility and versatility ideal for use on any dirt-moving job. Check the features that make this machine a big performer at low cost:

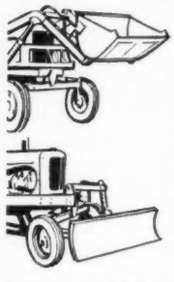
PLENTY OF POWER — for big-scale production. The WD-45 engine with POWER-CRATER design develops over 45 belt horsepower . . . to give you more power per dollar . . . more work capacity than other tractors of this type. Thousands already in use have given the WD-45 nationwide fame as a performance leader.

PLENTY OF WEIGHT — 5,325 lbs distributed right, give you the added traction and stability you need for tough, heavy digging and backfilling. It's a combination of a big, rugged wheel tractor and heavy-duty hoe to give years of continuous service.

MANY OPERATING FEATURES — let the operator do an efficient, thorough job in less time. With two-clutch control, the operator saves time because he can keep tractor in low gear while digging — can start and stop it on short moves with easy-to-reach hand clutch. The bucket, working like a giant hand, reaches out 12 ft, 8 in . . . digs 8 ft down . . . swings 160 degrees for wide area dumping. Backhoe assembly is all-steel, box-channel construction to take rough, hard use.

MANY SERVICE ADVANTAGES — will save you money. Engine features like exhaust valve rotators, removable cylinder liners, pressure lubrication give long life and lasting performance. Backhoe features, like replaceable bushings on all wear points, provide easy maintenance.

PLENTY OF VERSATILITY — keeps the WD-45 with backhoe busy all the time. The unit is mobile enough to reach any job, especially the hard-to-get-to places. With power-shift rear wheels, the tread can be adjusted in less than five minutes when extra stability is needed. Choose from six interchangeable buckets, 16 to 24-inch widths. Front-end loader and backfill blade attachments are available as optional equipment.



See the world-famous WD-45 with Henry Backhoe at your Allis-Chalmers industrial dealer, or write direct to the company for literature.

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TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

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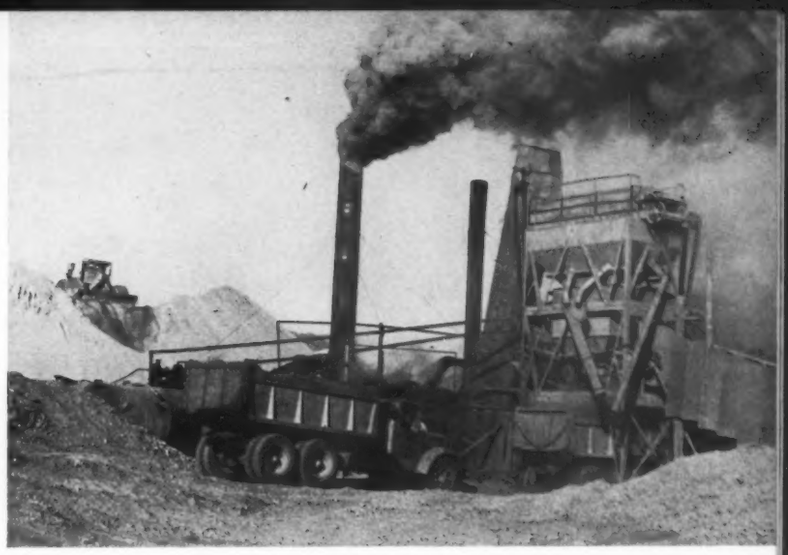
710 North Brookfield, South Bend 28, Ind.

New bituminous highway section replaces obsolete road; hard excavation and ground water present grading problems



A LeTourneau-Westinghouse dozer pushes aggregates into the feeder hopper of the Standard 4,000-pound asphalt plant as Mack NR dump trucks are loaded with hot-mix. The plant turned out 110 tons of material hourly, which trucks hauled away in 16-ton loads.

Heavy grading

Both tractor equipment and a shovel and truck spread handled the grading work. The hardest material in the cuts was a dense black diorite, a solid rock which graduated toward lighter material such as gravels, red clays, light dirt, shale, and rotten sandstone.

To handle the rock excavation, Strong brought in two large compressors—a 500-cfm machine with Caterpillar power, and a Gardner-Denver 365-cfm with International UD-18 industrial power. Three wagon drills, two Ingersoll-Rand and one Worthington, used Ingersoll-Rand Carset bits and regular rock bits, though in the black diorite it was necessary to use tungsten-carbide bits. Ordinary bits failed to break it.

A variable hole pattern was used, depending on the hardness of the formation. Wagon-drill holes, centered at approximately five feet, gave excellent breakage when they were column-loaded with Atlas Flo-dyn powder. For precise rock cutting on slope lines, Atlas Rockmaster delays up to No. 4 were used. They were spaced from the outside so that the inside slope shots fired last. The shots were arranged in depths which gave a maximum 18-foot-high bank for shovel loading.

Loading equipment behind this powder spread consisted of a Bucyrus-Erie 38-B shovel and a Northwest 80-D machine, both equipped with Esco dippers. Two LeTourneau-Westinghouse Tournarockers were brought in, along with seven Mack NR dump trucks. The latter machines were used after the hot-plant had been set up.

The tractor-equipment spread did its work in easier excavation. At the peak of operations, 12 Caterpillar D8's and Caterpillar and LeTourneau scrapers, 6 Super C Tournapulls, and 3 LeTourneau-Westinghouse C Roadsters were working. Several spare Caterpillar D8 tractors, 3 heavy-duty LeTourneau rooters, 4 trucks carrying 4,000-gallon water tanks, and 3

(Continued on next page—col. 3)

BARTLETT MFG. CO.
3035 E. Grand Blvd
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WE Combination Pruner and Saw
EASILY CARRIED IN SMALL CAR

Length	Weight
30 in. Pruner	2¾ lbs.
30 in. Saw	1⅓ lbs.
72 in. Section	2 lbs.
72 in. Section	1¾ lbs.

This combination can be quickly and easily assembled to make either of these two tools:
1 Heavy Duty Tree Trimmer (1¼" capacity) 14½ ft.
1 Fast-cutting Pole Saw 14½ ft.
If other lengths are required, specify extra sections 4 or 8 ft. long, to make the necessary length.

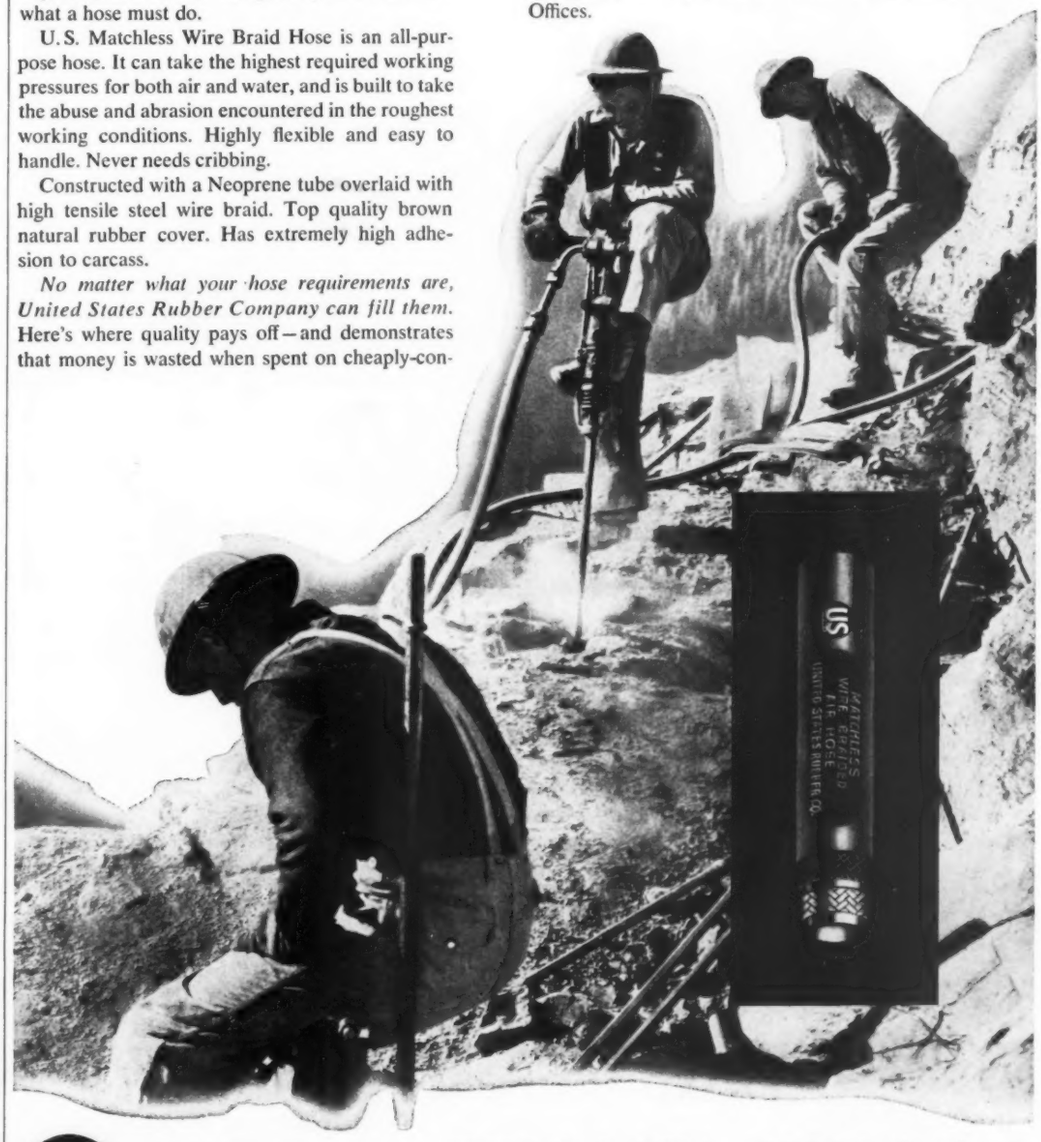
BUILT TO BE ABUSED...
It's U. S. Matchless® Wire Braid Air Hose!

This is the hose engineered specifically for hard rock mining, quarrying and tough construction work anywhere in the world—designed by men who *know* what a hose must do.

U.S. Matchless Wire Braid Hose is an all-purpose hose. It can take the highest required working pressures for both air and water, and is built to take the abuse and abrasion encountered in the roughest working conditions. Highly flexible and easy to handle. Never needs cribbing.

Constructed with a Neoprene tube overlaid with high tensile steel wire braid. Top quality brown natural rubber cover. Has extremely high adhesion to carcass.

No matter what your hose requirements are, United States Rubber Company can fill them. Here's where quality pays off—and demonstrates that money is wasted when spent on cheaply-constructed, short-lived hose. Expert "U.S." engineers will aid you in your hose selection and engineering problems. Call any of the 27 "U.S." District Sales Offices.



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Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

Fill material, brought down from the cut by Tournapulls, is laid in 8-inch-minus lifts and compacted to full density by sheepsfoot rollers pulled by Caterpillar tractors.

(*Continued from preceding page—col. 1*)

double sets of Gebhard sheepsfoot rollers for auxiliary processing on dirt were also available.

Early excavation with tractor equipment posed one of the most serious problems of the entire job. When Strong Co. first moved in, the ground was still soggy from winter rains. Ground water presented serious problems in loading, hauling, and processing material on a fill. This problem, which caused some delay in the work, came at a time when Strong Co., the successful bidder on several jobs for the Wyoming State Highway Department, had to move some of its equipment to the neighboring state, leaving five Cats and Carryalls on the Utah project.

Material dug out by Tournapulls and scrapers was hauled to nearby fills, dumped in 8-inch-minus lifts, and processed with necessary moisture. Sheepsfoot rollers worked full time to secure satisfactory compaction.

Rock-crushing problem

No problem on the job was quite as bad as that of crushing granular base course and mineral-filler materials. Granular base was obtained from a natural deposit. Mineral filler with a high PI was secured from an abandoned ore dump near the middle of the project—the only nearby source of the material. This dump contained quite a few pieces of scrap iron which caused trouble when they passed through the crusher. Clean sand was also taken from the old mine dump, and a total of 10 per cent of this was needed to reduce the PI to non-plastic and to reduce swell factors. After this material was trucked to the plant site and stockpiled, a secondary conveyor belt added it to the crushed ore entering the rock plant.

The crushing-screening plant, a shop-assembled outfit built for high production, had a Universal 20×36 jaw crusher driven by an International UD-18 engine, a set of Universal 24×40 roll crushers driven by a Caterpillar D13000 unit, a double-deck set of Pioneer 4×12 shaker screens, and a double-deck set of Simplicity 3×8 shaker screens. Its 30-cubic-yard Blaw-Knox surge bin was also equipped with a double set of

LO-HED Reinforced Concrete Pipe for Culverts and Sewers

Greater Capacity . . . Faster, Easier Installation . . . Less Cost!

Elliptical LO-HED Pipe carries a greater flow than its round equivalent—in a minimum depth of cut with increased depth of cover. LO-HED Pipe is easier to lay, to grade and line. Smooth walls and tight joints insure maximum hydraulic capacity, with a minimum build-up of debris in the invert, even under low-flow conditions. Furnished in pre-tested strengths to answer any low headroom problem, including culverts under highways and railroads.

Write today for specifications on time and money-saving LO-HED Reinforced Concrete Pipe.

A full range of sizes in LO-HED Pipe is available for nearly all culvert and drainage installations. Shown above are the LO-HED equivalents of round pipe sizes 18″—24″—30″—36″—90″—120″.

A·M

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CONCRETE PRODUCTS DIVISION

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Fed with hot-mix by one of the Mack trucks hauling between the Standard plant and the paving site, a Barber-Greene finisher puts down the second 1½-inch lift for the 3-inch-thick pavement.

Pioneer 3×8 screens. The raw pit feed was started through the plant by a Caterpillar D8 U-dozer. The material followed a general routing of jaw crusher, rolls, and various screens, which were tied together in closed circuits where necessary.

This plant, which produced the entire tonnage from a single setup, was powered by a Palmer 50-kw generator driven by an International UD-18. Power for night operations was also supplied by the unit.

On 2-inch-minus material for the subbase, the plant reached an output of about 200 tons per hour. On 1-inch-minus material, such as that used on the subbase leveling course and in mineral filler for the hot-mix, plant output was approximately 160 tons per hour. Since the rock plant was only 200 yards from the asphalt plant, a single stockpile of mineral aggregate was made close to the hot plant.

Crushed material for the subbase was hauled from the plant by a fleet of International 8-yard trucks, dumped according to volumes established by a tape, and processed. The blading done at the plant with material from the auxiliary sand pile was continued in the field by two Caterpillar No. 12 motor graders. As moisture was added to a windrow, the graders bladed the material across the road and back again. Both pneumatic and steel-wheel rolling was done to compact each lift.

Hot-plant setup

Aggregate — considerably wetter than usual—and the apshalt were mixed in a Standard 4,000-pound hot plant. This plant turned out 110 tons of material per hour, with aggregate moisture content ranging between 7 and 9 per cent.

The 120 to 150-penetration-grade asphaltic cement was trucked from Utah Oil Co's. refinery in Salt Lake City. Three longitudinal tanks, all heated with steam coils, provided an 18,000-gallon storage space for the material. There was also a 5,000-gallon storage setup for burner fuel.

A LeTourneau-Westinghouse C dozer shoved aggregate to the plant's feeder hopper, and from there the material passed through the cold elevator to the plant dryer where moisture was removed by steam-

(Continued on next page—col. 2)

NEW DITCHER

reduces the cost of narrow trenches

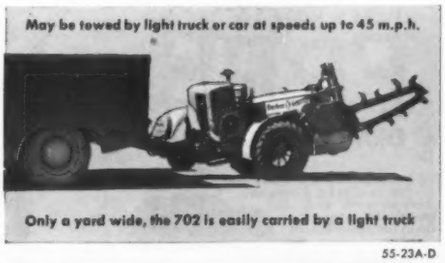
Built to "take it," this new, low-cost ditcher has the same rugged construction which has always characterized the famous line of Barber-Greene Ditchers.

No longer can hand digging be economical, even for the smallest job. The Model 702 is the fast, low-cost answer to trenching for gas, water, electric and telephone house services . . . for lawn sprinkler systems . . . small building foundations . . . for every kind of underground wiring including cables for power . . . telephone . . . traffic and R. R. signals . . . street and airport lighting.

The 720 is the ideal machine for the small contractor, and an excellent supplementary machine for larger users. This new Barber-Greene will do many jobs that normally would tie up heavier, more expensive, less portable equipment.

Condensed Specifications

40" boom digs 2½" or 5" wide • 30" boom digs 2¼" or 4½" wide • Quick width change • Infinite crowding speeds through Varidraulic Drive • Travel speed: 0-225 ft. per min. • Undercuts sidewalks • Dual Controls



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Cotta Transmission Co., Rockford, Illinois

COTTA HEAVY-DUTY TRANSMISSIONS

"Engineered-to-order"

A Huber 10-ton 3-wheel roller compacts the blended waterbound gravel subbase.

(Continued from preceding page)

atomized burner fuel. The mix was then resized on a triple-deck set of vibrating screens atop the plant, and properly sized rock dropped into the mixing hoppers for weighing.

Five Mack NR dump trucks hauled average loads of 16 tons to the job, and the material was laid by either an Adnun Black Top paver, or a Barber-Greene finisher. The machines laid two 11-foot and one 10-foot strip, three lanes making the finished road.

On the first contract, the 3-inch-thick lift of plant-mix material was put down in two 1½-inch layers. The 3-inch lift specified for the smaller contract was laid in a 2-inch leveling course of 1-inch-minus aggregate, and a 2-inch surface course of ¾-inch mineral aggregate. About five per cent of asphaltic cement was added to both mixes. Final rolling by a Galion tandem 8 to 10-ton machine developed necessary compaction.

Personnel

Strong Co's. operations were supervised by Carl Peterson, general superintendent. The job was designed and supervised under the general direction of E. G. Johnson, chief engineer of the Utah State Road Commission.

THE END

Nine-speed transmission for trucks up to 300 hp

■ A 9-speed heavy-duty transmission shifted with a single lever has been announced by the Fuller Mfg. Co., Transmission Division, Kalamazoo, Mich. The new Model R-1150 semi-automatic transmission is designed for trucks up to 300 horsepower, developing up to 800 foot-pounds of torque.

Like all models in the Roadranger line, the Model R-1150 completely eliminates gear-splitting. It provides nine speeds forward in selective ratios, evenly and progressively spaced, and shifted with one lever. Range shifts are quick and easy, preselected, automatic, and synchronized through Fuller's all-air range-shift control. Four speeds are available in low range and five in high range, with all ratios averaging 38 per cent steps.

Among the outstanding advantages provided by the new transmission are higher average road speeds, better utilization of horsepower through engine operation in peak horsepower range, greater fuel economy, no lugging on grades, and reduced driver fatigue.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 208.

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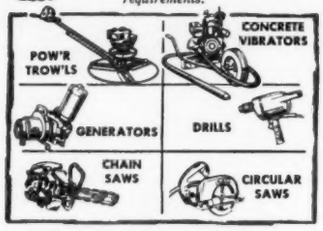
What's your most convenient power source? MALL offers you the world's biggest assortment of GAS ENGINE, ELECTRIC, and PNEUMATIC power tools—a size, a style, a power head to EXACTLY fit *your special requirements.*



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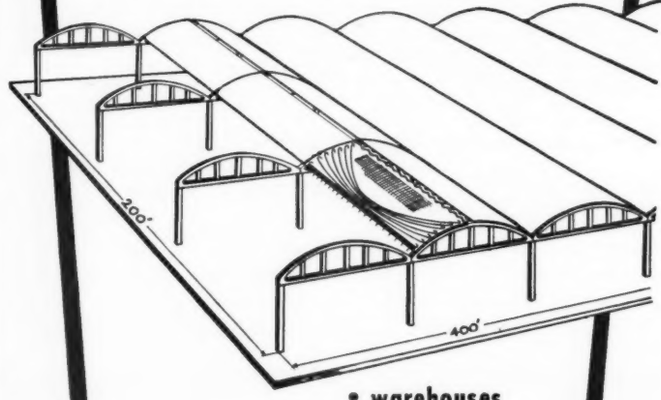

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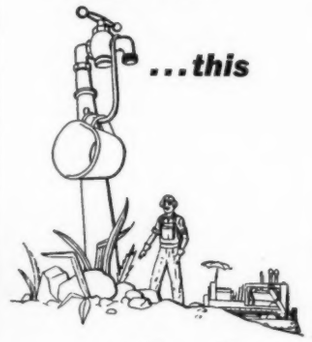

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Keeps Water Cool for Hours! Available with dispenser for Dixie Cups of your choice. Use in central location or carry with shoulder straps.

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"DIXIE" IS A REGISTERED TRADE MARK OF THE DIXIE CUP COMPANY

Clamshell attachment for tractor-mounted backhoe

■ A new clamshell attachment for the Ottawa tractor-mounted backhoe has been placed on the market. With the regular trenching bucket removed from the backhoe, the clamshell can be installed in less than 30 minutes.

Hydraulically operated, the clamshell has the benefit of down, forward, or up pressure. Furthermore, the operator can actuate either side of the clamshell individually or both sides simultaneously. An added feature is the use of automatic ejectors on both sides of the clamshell.

At full opening, the clamshell will dig a 30×44-inch hole with straight sides to a depth of 6 feet. It will dig a 30×66-inch hole straight down for 8½ feet, or a 30×88-inch hole to a depth of 11 feet.

For further information write to Ottawa Steel, Inc., Ottawa, Kans., or use the Request Card at page 18. Circle No. 327.

Hose and fittings assembled quickly

■ Fluid-carrying lines made from socketless hose lines can be assembled quickly, according to a folder available on request. With Aeroquip socketless fittings and hose, no clamp, lug, bolt, or socket is needed to hold the hose and fittings together.

Hose lines made with the socketless fittings and Aeroquip 1525 hose will stand pressures up to 250 pounds. Such lines can be used to replace rigid tubing in all low and medium-pressure applications.

The literature further points out that the socketless fittings and hose make it possible to do away with costly inventories of factory-assembled hose lines.

To obtain this literature write to Aeroquip Corp., Jackson, Mich., or use the Request Card at page 18. Circle No. 328.

Catalog on conveyor belts for bulk materials

■ Bulk conveyors for handling sand, gravel, stone, chips, and aggregate are shown in a new catalog from Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich. Illustrated with pictures of installations in a wide range of industries, the literature also has drawings of head and tail ends, cross sections, and drive and take-up units.

To obtain Bulletin No. 445 write to the company, or use the Request Card at page 18. Circle No. 215.

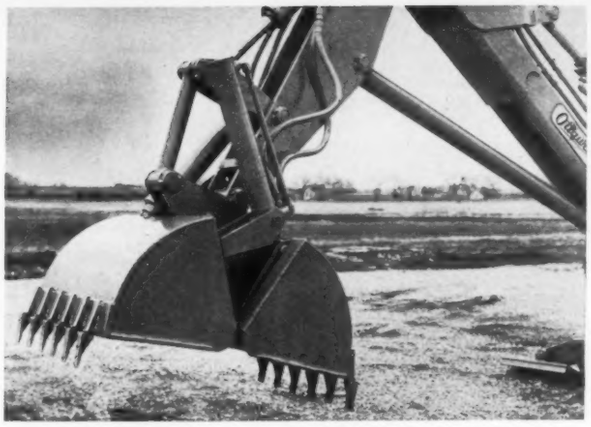
EAGLE BREAKER BALLS

Available of abrasion, impact resistant NI-Hard nickel-chromium-iron alloy for high breaking efficiency and tough semi-steel for regular jobs. Pear shaped, with easily replaced hook, in 5 sizes; 1500 lbs. to 8000 lbs. Spherical in 6 sizes; 1275 to 6350 lbs. Ask for Bulletin 952 on breaker balls, line weights, pile hammers.

Largest Manufacturers of Concrete Aggregate Washing-Classifying Equipment—Send for Catalog 55.

EAGLE IRON WORKS

159 Holcomb Ave., Des Moines, Iowa



◄ Bucket halves are individually controlled on the new Double-Draulic clamshell bucket for Ottawa backhoes.

Catalog on complete line of fork-lift trucks

■ A new bulletin lists the complete range of lift trucks made by Baker-Raulang Co., 1260 W. 80th St., Cleveland, Ohio. Included are gasoline-powered trucks, electric platform trucks, electric crane trucks, and battery-powered fork trucks.

Also shown are the Gas-O-Matic unit, which combines the features of gasoline power and electric drive, and the Baker Traveloader, a side-loading handling and carrying truck.

The bulletin includes tables of dimensions, capacities, weight, lift height, and other specifications.

To obtain Bulletin 54B write to the company, or use the Request Card at page 18. Circle No. 229.

Crushing Life Increased 14 Times *by* ***Hard-Facing***

The hard-faced rolls on this rock-crusher mill have been in constant operation for six years. During this time, the rolls have been pulverizing such abrasive materials as ferro-alloys, ore, dolomite, feldspar, rock, sand, and clay used for making brick. Unprotected rolls, performing the same operations, had to be replaced every four or five months.

The serrated roll shown at the right in the photograph is the roughing roll used for initial grinding or milling. The smoother roll, at the left, is a finishing roll used to grind the abrasive materials into a powder. Both rolls were hard-faced with HAYNES STELLITE alloy by the metallic-arc process to protect them from abrasion.

There are 14 HAYNES alloys . . . each developed to resist certain conditions of wear. Some of these alloys are hard and abrasion-resistant, some are tough enough to stand up under heavy impact . . . others resist corrosion, erosion, or heat. Use them to protect bull-dozer blades, dipper bucket teeth, sheepsfoot tampers, tractor rollers and other metal parts exposed to wear.

Your dealer carries a complete line of HAYNES hard-facing rods. Ask him for our descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana, for full details.

See... Your local Haynes Stellite Dealer

— or —

Write... to Haynes Stellite Company

"Haynes" and "Haynes Stellite" are registered trade-marks of Union Carbide and Carbon Corporation.

THIS TRADEMARK IDENTIFIES THE MORSE-STARRETT Wire Rope Cutter

MORSE-STARRETT PRODUCTS CO.
MORSE-STARRETT
MODEL NO. 1 MO-ST PAT. NOS. 1743404 1769001
CABLE CUTTER
OAKLAND, CALIFORNIA, U.S.A.

EASY
No special skill is required in the hammer-blow operation of this perfect wire rope cutting tool.

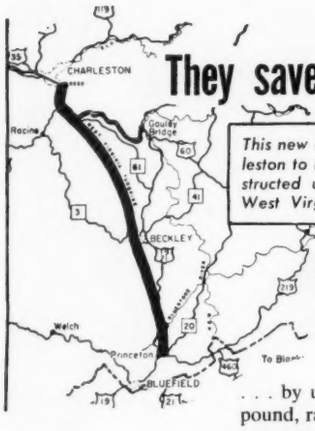
CLEAN
The cut is clean, smooth, without jagged ends; the wire rope is easy to thread or splice.

FAST
Ten Seconds, or less, is the usual time required to complete the smooth, clean cut.

SAFE
The operator is safe, because the blade is enclosed and locked in the body of the tool.

SEE YOUR DEALER OR WRITE DEPT. "M"

MORSE-STARRETT PRODUCTS COMPANY
1204 - 49th AVENUE OAKLAND 1, CALIFORNIA



They saved over $60,000.00 when They Built the W. VA. TURNPIKE

This new 88-mile turnpike, from Charleston to Princeton, W. Va., was constructed under the direction of The West Virginia Turnpike Commission.

. . . by using Permite Concrete Curing Compound, rather than the older method of curing concrete, The West Virginia Turnpike Commission was saved at least five cents a square yard on paving costs. How was this possible? Let Mr. W. D. McCleish, superintendent of the job for J. B. Michael & Company, Inc., one of the paving contractors, tell you:

"Our experience has shown that our use of Permite PM-60 resulted in savings of 37% in time and labor over the originally prescribed method of curing. We are happy to attest to the reliability of Permite PM-60. Batch by batch, this product consistently met the specifications of the West Virginia Turnpike Commission."

These savings substantially lowered the Commission's costs. You, too, can save time and labor, and provide lower costs.

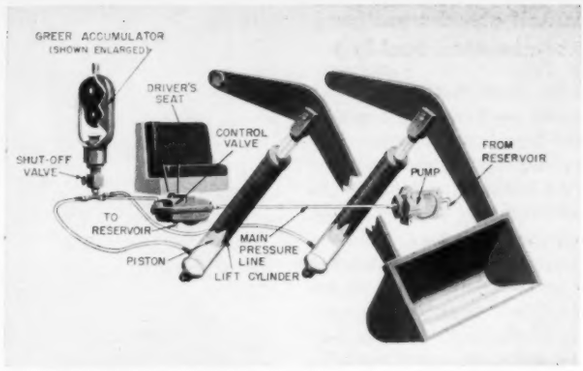
with

PERMITE CONCRETE CURING COMPOUND

Meets specifications of the Corps of Engineers, U. S. Army; The Department of the Navy, NAVDOCKS; and other Federal Agencies. Write for test data.

ALUMINUM INDUSTRIES, INC., CINCINNATI 25, OHIO

Invest in
U. S. DEFENSE BONDS
Now Even Better



This schematic illustration shows a typical installation of the Greer hydro-pneumatic accumulator on a tractor-loader. The device is connected to the hydraulic pressure line of the equipment between the control valve and the lift cylinders.

Accumulator on hydraulic tractor-loaders absorbs damaging shock and vibration

■ The effects of shock and vibration on hydraulic tractor-loaders and other mobile equipment are reduced substantially by a hydro-pneumatic component manufactured by Greer Hydraulics, Inc., New York International Airport, Jamaica 30, N. Y. Installed in the main hydraulic-pressure line of such equipment, the Greer accumulator absorbs the impact of sudden starts and stops on both the machine and the driver.

According to the manufacturer, this shock-absorber action is sufficiently effective to allow the equipment to operate at higher speeds even over rough terrain. It is stated, also, that installations made on both crawler and rubber-tire vehicles have resulted in a reduction in both maintenance costs and operator fatigue.

The complete hydro-pneumatic accumulator consists of a steel alloy shell, a seamless synthetic-compound separator bag with an air valve, and an oil-port assembly. The shell contains the rubber bag, which is precharged with gas to the required pressure. When the equipment is operating, hydraulic fluid is forced into the shell through the oil port, compressing the gas-filled bag. Sudden shock on the hydraulic system forces more oil into the shell, where the impact is absorbed by the compressible bag.

In a typical installation on a bucket loader, the accumulator is mounted anywhere on the machine with brackets. It is pipe-teed to the main hydraulic line between the control valve and the lift cylinders.

The Greer accumulator is available in several standard sizes operating at pressures up to 6,000 psi.

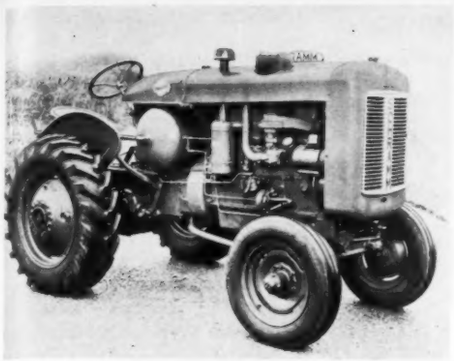
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 238.

PICK A MONEY MAKER!

When you're buying a dragline bucket for your next job, keep in mind three important qualifications. First, Digging Ability . . . second, Long Life . . . third, Low Repair Expense. For more than forty-five years Omaha Dragline Buckets have passed these tests in actual work done on the job. Write for catalog giving specifications of 4 available types.

OMAHA DRAGLINE BUCKETS

DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.



The Schramm Pneumatractor is now available in a model designed primarily for air-compressor service. The earlier model that mounts several attachments will continue to be produced.

Self-propelled compressor offered in new model without attachments

■ A modified version of the Schramm Pneumatractor, designed for air-compressor service only, has been placed on the market. The original or Heavy Pneumatractor mounts and operates a front-end loader and backhoe and other accessories in addition to providing compressed air with a 125-cfm engine-compressor power plant.

The new Standard model, using the same power plant, is reported to sell for less than most 125-cfm two-wheel-mounted portable compressors.

None of the compressor performance has been sacrificed in the new model, since only the tractor has been modified. The Heavy Pneumatractor that operates with attachments will continue to be produced.

For further information write to Schramm, Inc., West Chester, Pa., or use the Request Card at page 18. Circle No. 329.

Need information on equipment? Check the card at page 18 and return it to us.

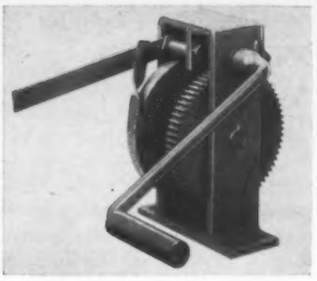
Cranes and hand winches for medium-duty trucks

■ Truck-mounted utility cranes and hand-operated winches have been added to the Watson line of auxiliary equipment for light and medium trucks.

The cranes are being produced in 500, 1,000 and 2,000-pound capacities. They feature full-circle swing, which simplifies loading by one man.

The winches are available in two styles, each of 1,000-pound capacity. One model features a 6-inch band-type brake and needle bearings. Either model can be installed on tractors as well as on trucks.

Both the cranes and hand winches have steel cut gears and a drop-forged steel ratchet, which is spring loaded for additional safety.



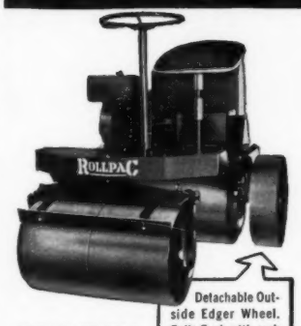
A new H. S. Watson hand winch.

For further information write to H. S. Watson Co., 1316 67th St., Emeryville, Calif., or use the Request Card that is bound in at page 18. Circle No. 265.

SOIL-AIRE

ROLLPAC

Ruggedly built for heavy-duty service



Detachable Outside Edger Wheel. Rolls flush with curb or wall.

$895.00

A Standout Popular-Priced One Ton Roller. Send for Catalog.

SOILAIRE INDUSTRIES

Minneapolis 3, Minnesota

Sold by over 75 distributors in United States and Canada

New portable Mixall produces up to 5 tons of hot mix per hour

TIMKEN® bearings keep it rolling

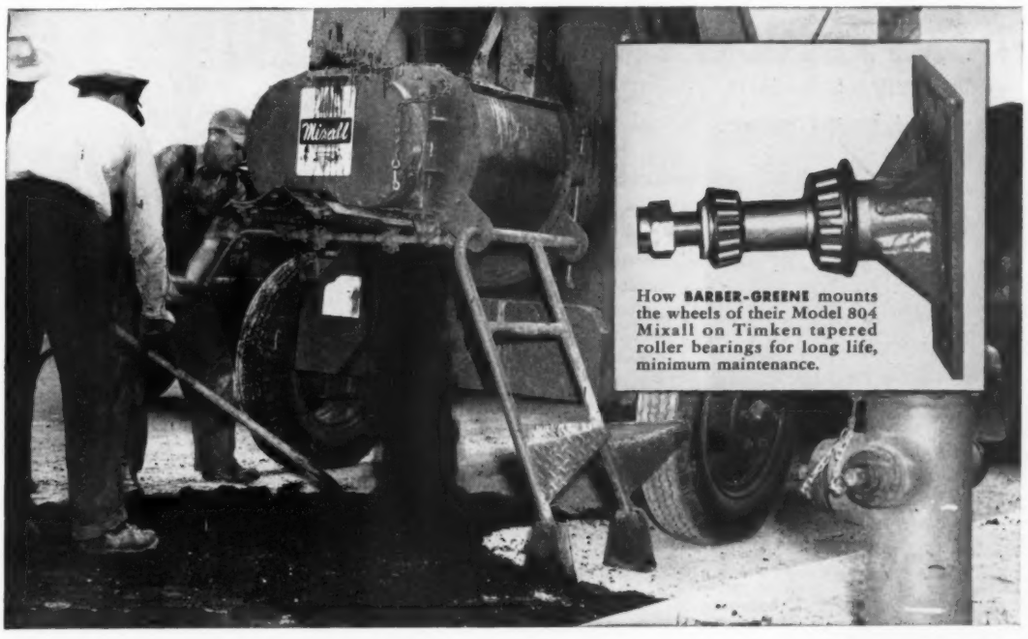
THE new Barber-Greene 804 Mixall will produce up to 5 tons per hour of any type hot mix, up to 10 tons per hour of cold mix and will produce low slump Portland cement mixes. It's compact and portable, especially suited for small maintenance and paving jobs. Timken® tapered roller bearings on the wheels keep it rolling in all kinds of weather, over all kinds of terrain, assuring availability.

The dirt and mud the Mixall sometimes works in, call for effective closures. By holding housings and axles concentric, Timken bearings make closures more effective. Lubricant is kept in—dirt and moisture are kept out. Result: less time out for maintenance and repair.

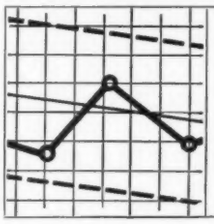
Since the Mixall travels almost constantly from job to job, often over rough terrain, the wheel bearings take a beating. But the tapered design of Timken bearings lets them take both radial and thrust loads. And full line contact between rollers and races of Timken bearings provides load-carrying capacity to spare. Shock loads are easily taken because Timken bearings are case-hardened to give them a hard, wear-resistant surface over a tough, shock-resistant core.

If you want rugged dependability in the construction equipment you buy or build, look for the trade-mark "Timken" stamped on every bearing. You get long life with minimum friction. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How BARBER-GREENE mounts the wheels of their Model 804 Mixall on Timken tapered roller bearings for long life, minimum maintenance.



STATISTICAL QUALITY CONTROL

To insure uniform high quality and closer tolerances, the Timken Company uses statistical quality control. With it, tolerance deviations are plotted graphically. It's one of industry's newest, most scientific methods of improving product uniformity.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

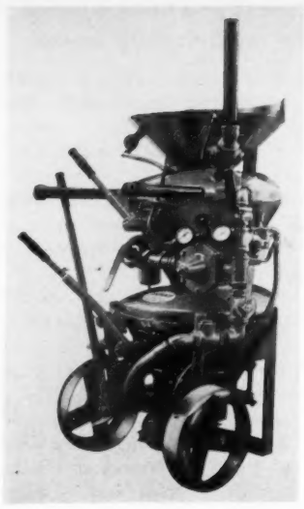
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⓘ AND THRUST →ⓘ← LOADS OR ANY COMBINATION →ⓘ←

Concrete placer handles big and small jobs

■ A new concrete-gunning machine has been added to the Airplaco line of concrete-placing equipment. The Nucretor is designed for use where large quantities of concrete are to be placed. However, the machine's wide range of operating capacities makes it possible to use it on jobs of any size, including small ones. Maximum capacity is 6 cubic yards of aggregate per hour, while the complete operating range runs from ½ to 6 cubic yards per hour.

The design of the Nucretor's slide valves, which allow materials to pass from the upper into the lower hopper, makes it possible to gun extremely wet materials. Exceptionally large clearance in the feed mechanism permits the larger operating capacity without increasing the over-all size of the machine. The ball-type slide valves are easy to operate and have their own pressure seals.



The new Airplaco Nucretor concrete-gunning machine is designed to handle ½ to 6 cubic yards of cementitious aggregate per hour.

Other features of the Nucretor are: readily accessible controls; easy maintenance and clean-up after operation; and light weight.

The Nucretor, like the Airplaco Bondactors, can be used for placing all types of cementitious aggregates as well as for wet or dry sandblasting. Other recommended uses include: waterproofing; stuccoing; repair and maintenance of concrete, brick, stone, and other masonry; fabricating precast wall and roof sections; installing refractory linings, and applying insulating concretes.

For further information write to Air Placement Equipment Co., 1009 W. 24th St., Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 313.

Excavator dump bodies

■ A catalog sheet just released provides detailed information on the Hercules Series HD heavy-duty excavator bodies.

Complete specifications are given, together with illustrations showing bodies designed for both underbody and front telescopic-hoist applications. This data includes standard lengths, capacities, and suggested hoist applications.

To obtain this literature write to Hercules Steel Products Corp., Galion, Ohio, or use the Request Card at page 18. Circle No. 306.

Road-disk attachment for motor graders

■ A new type of road-disk attachment which operates from the scarifier controls of all makes and models of motor graders is shown in a folder from Shav-O-Disc, Inc., 149 Union Ave., Bakersfield, Calif. The Shav-O-Disc will cut any asphaltic, plant-mix, or oil road material, and is said to be highly effective on clay and adobe soils.

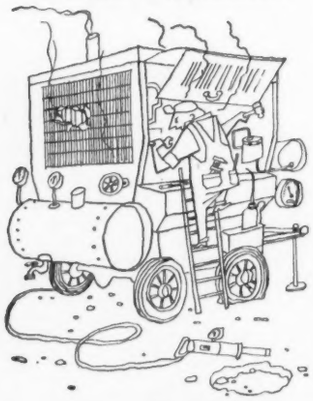
The attachment, which is adjustable for cutting depth, is equipped with 20 - inch - diameter alloy - steel disks. The bearings are a heavy-duty type with pillow blocks said to withstand four times the stress that any motor grader can bring to bear on them. Cutting width is 56 inches.

Operating under the full weight of the motor grader, the attachment has the benefit of from 4½ to 6 tons of pressure on the disks. The Shav-O-Disc is a gang-type unit in two opposed sections.

According to the literature, the Shav-O-Disc eliminates the necessity for scarifying most roads because it shaves off the top of the road, permitting proper maintenance practices. Used for cutting shoulders, it permits blading to be done immediately after the original cut is made because the grader blade can create a windrow at the same time that the disk is cutting.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 274.

Why lose money with big, oversize compressors?



a SMITH COMPRESSOR will do the job for less!

MODEL 120-P Compressor
Powered by CHRYSLER Industrial Engine, Ind. 22

Save your big compressors for big jobs! The Smith 120-P will handle the majority of your compressor jobs, for less! Heavy-duty Chrysler engine has 413 cu. in. displacement. Simple, compact compressor design—no coupling or clutch. Compressor pistons operate at 120° apart for smooth, even flow of air. Corrosion-free manganese bronze compressor valves with stainless steel discs. Finned after-cooler reduces air temperature approx. 200°, gives longer hose life!

. . Also the Smith 70-P Compressor

MAIL COUPON NOW!

Gordon Smith & Company, Inc.
483 College Street, Bowling Green, Ky.
Send complete literature and prices on Smith 120-P and 70-P compressors.

NAME_____

ADDRESS_____

CITY_____ STATE_____

☐ Also send name of nearest dealer.

DRILLING CONTRACTORS

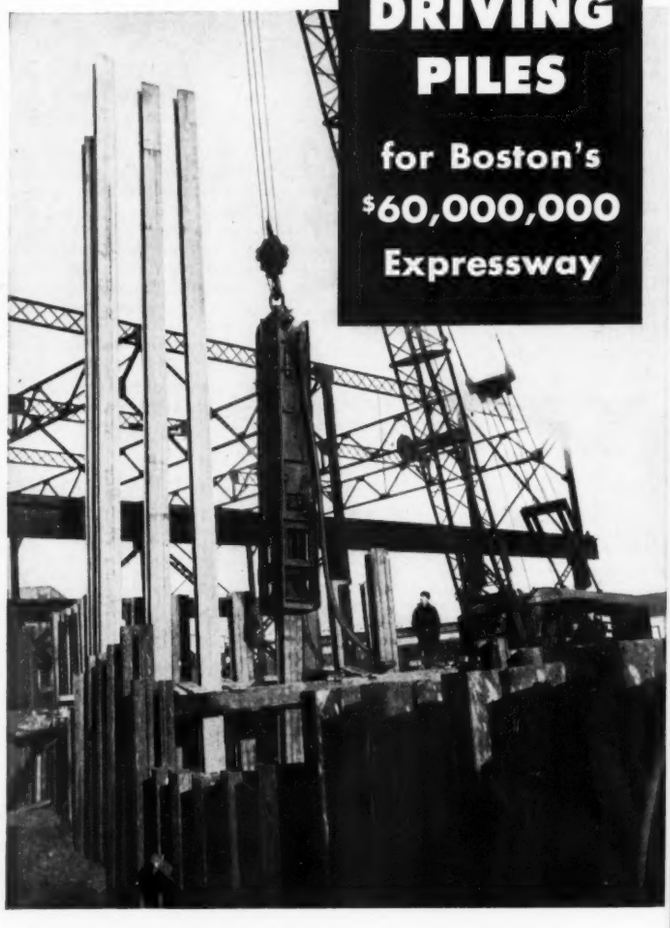
Diamond and Shot Core Borings, Dry Sample Borings, Grout Holes and Pressure Grouting, Foundation Testing for Bridges, Dams and all Heavy Structures

Leading manufacturers, also, of High-Speed Diamond Drilling Machines and Complete Accessory Equipment, Including all types of Diamond Drilling Bits.

Write for Catalog No. 320

SPRAGUE & HENWOOD, INC.
Dept. C, Scranton 2, Pa.

DRIVING PILES for Boston's $60,000,000 Expressway



This McKiernan-Terry Type S8 Single-Acting Pile Hammer is shown driving 89-lb. H-piles for piers of the double-deck high-level bridge over the Charles River for this outstanding traffic artery.

Here, as in many thousands of foundation jobs . . . large and small . . . for bridges, dams, buildings, piers, highways, etc. . . . contractors use McKiernan-Terry Single-Acting and Double-Acting Pile Hammers and Double-Acting Pile Extractors to assure speedy and economical work.

Write for bulletins describing McKiernan-Terry Pile Hammers and Extractors. MK367

McKIERNAN-TERRY CORPORATION
82 Richards Avenue, Dover, New Jersey
Manufacturing Engineers • Plants: Harrison, N. J., Dover, N. J.
Also builders of Coal and Ore Unloaders and Bridges, Grab Buckets, and Special Machinery

Plans from which this pneumatic machine for demounting big tires can be made are available from Autocar Division of White Motor Co.

Plans for building pneumatic-tire mounter

■ The plans for a specially-designed pneumatic tire mounter that has proved to be a time and labor saver for Autocar Division of White Motor Co., Exton, Pa., are available from the concern. Mounting rims and tires for the big Autocars had been a heavy job taking the time and work of two or three men, but with the new pneumatic machine the company reports that one man does the job easily.

The machine consists of a circular casting which can hold wheels or demountable rims 20, 22, or 24 inches in diameter. Fastened on a plate in an 18-inch-deep pit below the casting are a pair of Bendix-Westinghouse air-brake cylinders which have a capacity of 1,500 to 2,000 psi. Both brake cylinder arms are fastened to a cross-piece, and a steel spindle rod attached to the center of this cross-piece rises through the casting to about 5 inches above the floor. A ⅝-inch cross-rod is mounted through the top of this spindle.

In mounting, the rim base and tire are dropped on the stepped-down casting. A side ring is slipped on and the locking ring positioned. A three-armed spider is hooked to the spindle rod which comes up through the center from the pit. The three spider arms notch onto the side ring and, as the operator turns on the compressed air, force it and the bead of the tire down past the locking-ring seat on the rim.

To obtain the plans for this device write to the company, or use the Request Card at page 18. Circle No. 330.

New film shows fork-lift in on-the-job-shots

A new 15-minute color film showing on-the-job applications of the TerraTrac M-3 crawler-mounted fork-lift has been released by American Tractor Corp. Action shots of the new lift extension carrying and placing cement blocks, brick, steel, and roofing are included in the film. It also illustrates the quick convertability of the machine for bulldozing and handling bulk materials.

Arrangements for viewing the film may be made through local TerraTrac dealers or through American Tractor Corp., Churubusco, Ind.

Hydraulic bender for angle iron and pipe

■ A wrenchless-type bending machine that bends rounds, pipes, flats, tubing, squares, conduit, and angle iron is made by Hossfeld Mfg. Co., 462 W. Third St., Winona, Minn. The Hossfeld No. 2 universal iron bender features quick changeover from hand operation to hydraulic power.

The hand method is faster and more suitable for forming coils, eye bolts, U's, and S-bends on light stock. With an easily attached hydraulic unit, the machine has ample power for bending 2×2×3/16-inch angle iron or 2-inch pipe.

For further information write to the company, or use the Request Card at page 18. Circle No. 331.

Brooklyn engineers honor memory of Roebling widow

Celebrating the 70th anniversary of the opening of the Brooklyn Bridge, the Brooklyn Engineers Club donated a memorial plaque to the City of New York in honor of Mrs. Emily Warren Roebling, wife of the designer. Dr. D. B. Steinman made the award.

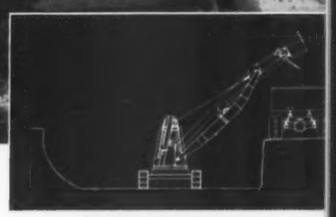
Now built by LIMA... the portable, 3/4 - swing, extra-output BADGER

LIMA is proud to be able to offer the fast-moving, fast-working BADGER as part of the standard LIMA line of quality-built machines. This highly portable, hard-working, ruggedly built ½ yard shovel is easily convertible for use as a trench hoe, clamshell, dragline, pile-driver, crane or skimmer. Available with gasoline, Diesel or electric power, the BADGER has proved on the toughest jobs that it's the fastest, most dependable shovel in its class.

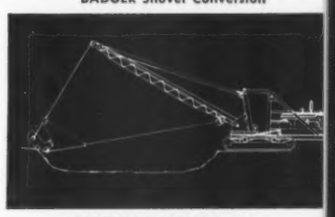
Remember, it's as true of the BADGER as of every other machine built by LIMA. COMPARE QUALITY! No other machine gives you as much:

1. Lighter swinging weight.
2. Greater stability.
3. Better visibility.
4. No tail swing.
5. Extra dumping height.
6. Extra reach.
7. Anti-friction bearings.
8. Easily portable.
9. Easily convertible.

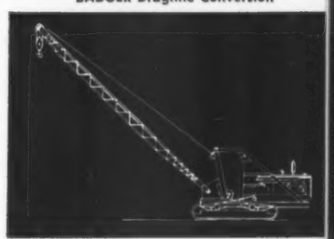
It will pay you to find out how the BADGER can benefit your own operation. Contact your nearby BADGER distributor, or write today to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



BADGER Shovel Conversion



BADGER Dragline Conversion



Above BADGER Crane Conversion

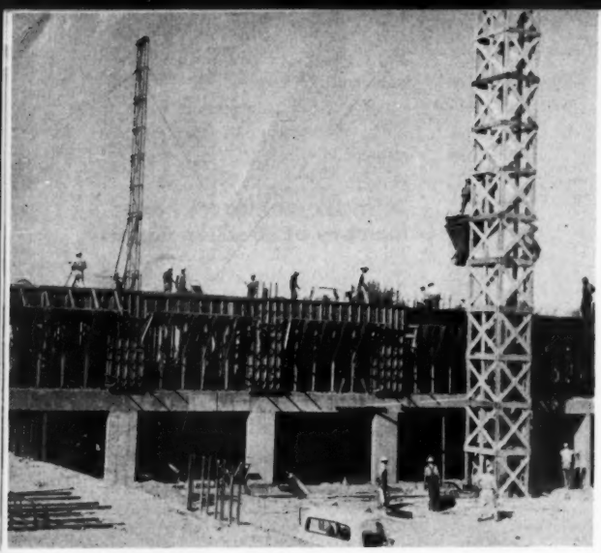
Below BADGER Trench Hoe Conversion

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.



Concrete is hoisted by means of this wooden tower to the pour level, where workmen wheel it in buggies to the second-floor column forms. Wood forms were fabricated on the job.

Simple lines, good concrete schedule cut building costs

New headquarters for Colorado Department of Highways is a reinforced-concrete structure on simple footings.

Simplified design, calling for reinforced-concrete throughout, and a good concrete-placing schedule are cutting costs and construction time on the new administration building being built in Denver for the Colorado State Department of Highways. A varied-level U-shaped structure resting on simple footings in good soil, the building is being constructed at a cost of $1,900,000.

C. H. Leavell & Co., El Paso, Texas, and Denver, has the contract with the Colorado Highway Office Building Authority. Work was started April 19, 1954, and is expected to be completed by August of this year. The administration building is the first and largest of three structures to be built on a plot in south Denver as part of a Colorado Highway Commission centralization program.

Designed by T. H. Buell & Co., Denver architectural firm, the administration building follows simple construction lines. It is 540 feet wide and has 265-foot-long wings forming the parallel lines of a U. Various sections are one, two, or four stories high. Foundations, walls, and pilasters are of reinforced concrete, and exterior facing will be buff brick and limestone trimming.

In line with most contemporary building-construction practice, Leavell farmed out all the specialty work—excavation, plumbing, electrical work, heating, and air conditioning.

In excavating for foundations, the earthmoving subcontractor used an International TD-14 tractor with dozer, a Northwest dragline working with nine dump trucks, one Caterpillar DW20 with an 18-yard scraper, a D8 push Cat, and an auxiliary Cat and roller. A backhoe also was used for the excavation of the foundation, footings, and the mechanical tunnel which runs inside the building perimeter line and carries electrical conduit, telephone cable, and steam and sewer lines.

Working rapidly to get the building up out of the ground before fall rains hit, Leavell's crews used this equip-

New Increased Power **International T**

NEW Power... New gearing... New ruggedness—for greater producti
NEW Track Frames... 300 per cent stronger
NEW Finger-Tip Power Steering... advanced hydraulic design
NEW Operator Compartment... comfortable driver's seat—easy-to-reach controls
NEW Track Roller Oil Seals... 500-hour period between lubrication
NEW Positive Self-Energizing Brakes, 13% more effective brake area
NEW Appearance... sleek grille, heavy fenders, 75-gallon fuel tank. Better visibility... control-tower view front and rear

LOOK AT THAT LOAD as operator applies 103-drawbar hp of new TD-18A. Steering is effortless with new hydraulic finger-tip controls and positive, self-energizing brakes.

Here's
tractors
increase
increase
The i
with 103
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Leavell's general superintendent, H. E. Monroe (right), and Jack Cohrs, assistant project engineer, discuss a phase of the building project. Southwest steel pan forms are used to form this second-floor deck.

ment to muck out the excavation prism down to a grade line approximately equaling the top of footings and the mechanical tunnel. Part of the dirt was hauled away and part was used to build up low spots around the building to facilitate landscaping after the structure is finished. The material at the site consisted of a stiff clay-like soil with good bearing value. Despite a month-long strike of operating engineers, this part of the work was successfully finished in plenty of time to get concrete started. By mid-September, every part of the concrete work below ground was safely finished and out of the way.

Fast concrete work

Although simplicity of design is the rule, there are many difficult sections in various parts of the building which slow work progress. Nevertheless, Leavell's crews have been able to account for good concrete production. The 7,500-cubic-yard concrete item in the project was set up originally on the basis of about 250 cubic yards per week. On June 21, however, Colorado ironworkers went on strike, and the job was shut off completely by June 24. Fortunately, the simplified building design made it possible to step concrete-placing operations up to 500 cubic yards a week, once the strike was over, and the job was back on its original schedule by late November.

All walls and pilasters have been formed at good speed by Uni-Form steel form panels. There has been quite a bit of job carpentry necessary, however, since all tunnel forms consisted of prefabricated 4×8 plywood panels. All wood forms have been built on the job. The lower portion of each floor is of typical beam and pan joist construction, and these forms are being supported by Southwest steel pans. Southwest Steel Products, Houston, Texas, also furnished and erected beams under 2 feet wide; spandrel beams and others more than 2 feet wide were made by Leavell's crews. There are approximately 1,000 Acrow patented shores on the job, principally for the support of the steel pan forms in the floor decks. These shores are used in a long line under each end of the steel pans to support the weight of pours.

Reinforcing steel is being furnished by Colorado Builders Supply Co., Denver, which delivers material to the job. Installed by the contractor's crews at regular intervals, the steel is formed as a column inside vertical walls to stiffen the building and give it strength.

Pour setup

Ready-Mixed Concrete Co., Denver, a commercial firm supplying the concrete, is delivering it to the job in Challenge truck mixers, and dumping it as conditions require. Much of the low concrete was, of course, dumped directly into position from the trucks, and some was transferred by crane. When the building was well out of the ground and the higher floors had to

TD-18A Now with 103 Drawbar H.P.

Here's the crawler tractor with everything contractors need to meet increased competition—increased workpower, increased ease of operation, increased durability:

The improved INTERNATIONAL TD-18A, now with 103-drawbar horsepower at 24,300 lbs. maximum drawbar pull in first gear at rated rpm.

Double check all these great new TD-18A features—right here on these pages—on your job where you can take over the controls and appraise their value in extra work done for lower cost. Your INTERNATIONAL Industrial Power Distributor will arrange your own personal shake-down test of the TD-18A any time you say.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

be reached, two hoisting towers were erected—a Patent tower with Jaeger hoist, and a wooden tower with an Allis-Chalmers hoist. Concrete for the exterior columns is placed with the help of a Mixermobile Scoopmobile tower, which can hoist the concrete directly to position.

The fresh concrete, mixed with air-entraining agent to make it more workable, is dumped to Georgia buggies when it reaches the floor on which the pour is to take place. Using short prefabricated runway sections, concrete men wheel the material over to its point of placement and dump it. Two Dart vibrators consolidate the material. The floors are finished off for the most part with a tight steel trowel finish, with either hand finishing or a Kelley float doing the job. Later on, the floors will also get asphalt or vinyl tile, or a combination of both.

After its completion this fall, the big administration building will house the entire administrative and supervisory engineering offices of the state highway department. These offices are at present scattered all over Denver in five different locations. At a cost of about what it requires these days to build 20 miles of highway, the department will have streamlined its operations and made working conditions much more pleasant at the same time.

Personnel

The Colorado Department of Highways is under the general supervision of Mark U. Watrous, state highway engineer, with W. A. Gray as resident engineer on the job and Frank Laverty in charge of mechanical operations. Bruce Morrison represents the architectural firm. Contractors' operations are being directed by H. E. Monroe, general superintendent, reporting to C. G. Marrs, project manager. Joe Trujillo is project engineer for the contractor, and Jack Cohrs is his assistant. THE END

Drive taps truck's power

■ A power drive that mounts directly on top of a vehicle's transmission to provide positive direct drive for such equipment as earth drills, air compressors, winches, welders, and generators is shown in a leaflet available on request. The Tangen power drive receives full power directly from the vehicle's engine through the main drive gear to transmit it to another piece of equipment.

This drive does not interfere with the normal operation of the transmission, and requires no structural change in the chassis of the vehicle. Easily installed, the power drive has a Pierce governor on the output shaft to regulate engine speed when the drive is in operation.

Two models are illustrated in the literature. The Model A is designed for spur-gear four-speed transmissions such as the Warner T-8, T-9, T-9A, and the New Process. These transmissions are currently used in the International 4×4 models, the Dodge Power Wagon, Four Wheel Drive, and other widely used trucks. The Model A is available in 1 to 1, 1½ to 1, and 2 to 1 ratios.

Also shown is the Model D designed for the helical-gear four-speed Syncro-Shift New Process transmission currently used in Dodge Truck models through the 2-ton size. This unit is available in a 1½ to 1 ratio only.

To obtain this literature write to Mobile Power, Inc., 611 S. Walnut St., Lansing 15, Mich., or use the Request Card at page 18. Circle No. 288.

Booklet answers questions on roof-decking material

■ The answers to the 25 most frequently asked questions about Tectum wood-fiber roof-decking material are given in a booklet from Tectum Div., Alliance Mfg. Co., 105 S. Sixth St., Newark, Ohio. Among other subjects, the questions relate to methods of manufacture, applications, effects of water, condensation, impact, and aging.

To obtain Form No. 1102-A write to the company, or use the Request Card at page 18. Circle No. 281.

Again Marion leads the way with major hoist improvements, including a new leakproof seal.

The seal is a combination iron ring plus special underseals that more nearly than any other ring mechanism eliminates creeping. Actual tests carried on with a full body load showed virtually no creeping in 48 hours.

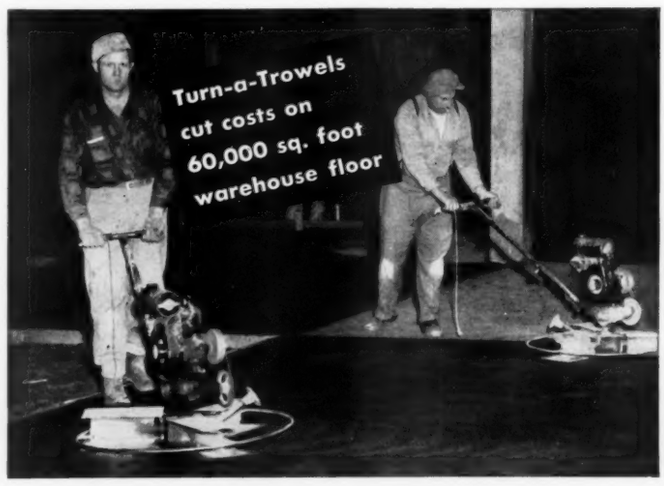
Other major improvements on Models 621-A2, 721-A2 and 726-A2 include outside body guides . . . increased flexibility in the sub-frame without loss of strength . . . increased clearances at base of cylinder, making it easier to service valve and pump.

Here is another example of Marion's leadership and advanced designing. Get all the facts from your nearby distributor or write direct today.

"Designed on the Job" MARION BODIES AND HOISTS

MARION METAL PRODUCTS CO., MARION, OHIO, U. S. A.

A complete line of standard and special hydraulic hoists and dump bodies to fit every need.



". . . they 'Mastered' the situation".

"Our Master Turn-a-Trowels knock down every hump on the floor slab." "I've used others that ride right over the uneven spots."

Contractors can make those statements because the Turn-a-Trowel has rigid—not flexible—blades. Bumps in the floor *have* to come off, so Master-finished floors are flat.

And, because Master blades *adjust* for either floating or finishing, they stay right on the machine. You can't lose or mislay them.

The Master Turn-a-Trowel is a rugged, powerful, top-quality piece of equipment that will help you finish concrete better, quicker and cheaper. Write for information on 34" and 48" models or see your Master distributor for a free demonstration.

Portable Generator Plants. AC or DC; gas, diesel, natural gas engines. ½ KW to 12.5 KW; portable mountings. Also continuous duty plants up to 20 KW Floodlights.

Concrete Vibrator. 9,000 rpm vibration, yet lightweight; rugged, gives long service; gas and elec.; wheel mounting available; accessory tools; 1½ to 6 hp power units.

Midget Trowel. New Lightweight, one man carries; gets into tight spots; only 24" across yet does top trowel job 6 times as fast as by hand. 70 lbs.; 1 6 hp engine.

Portable Space Heater. Clean, instant, odorless heat blown where you want it, rugged, longlasting, trouble-free; uses kerosene or fuel oil; 160,000 to 400,000 BTU

MASTER VIBRATOR COMPANY
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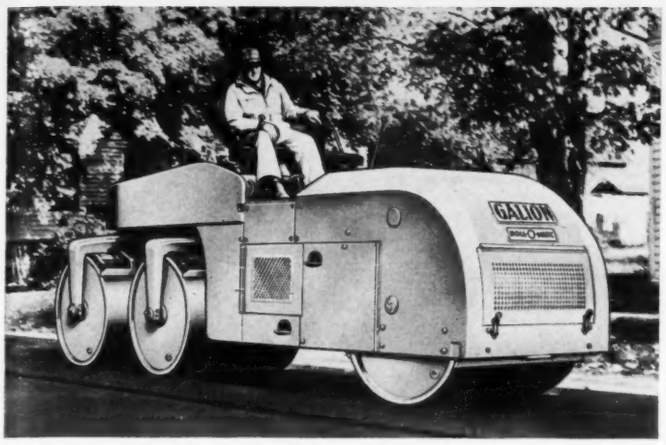
MASTER



This new 14 to 20-ton Galion three-axle tandem roller is equipped with the Roll-O-Matic torque-converter drive. The fluid drive multiplies engine torque and applies driving force as needed.

Three-axle tandem roller with torque converter can maintain a constant rolling speed

■ A three-axle tandem roller has been announced by Galion Iron Works & Mfg. Co., Galion, Ohio. The new roller has a variable weight range from 14 tons (metal weight) to 20 tons fully ballasted with water. In addition to the main compression or drive roll, it has twin guide rolls with synchronized hydraulic steering. Finish rolling with this equipment is said to be up to 50 per cent smoother than with conventional tandems, and up to a 60 percent greater tonnage of material can be compacted per day.

An important feature of the Galion three-axle tandem roller is the Roll-O-Matic torque-converter drive supplied as standard equipment. Galion emphasizes that this type of drive differs from a fluid coupling drive. A fluid-coupling transmission requires a manual gear-shift mechanism, and the coupling itself never multiplies engine power.

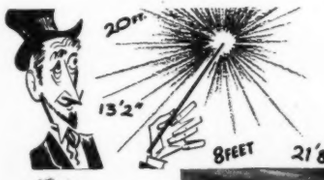
The Galion Roll-O-Matic torque-converter drive has no gear-shift mechanism. Furthermore, it automatically multiplies the engine driving force by means of oil in motion instead of by transmission gears. Automatically applying driving force as the work demands, it maintains the desired roller speed regardless of grade or working conditions.

The manufacturer cites reports indicating that the Roll-O-Matic drive saves up to 25 per cent in fuel, increases engine life by 35 per cent, and the service life of forward-reverse clutches by 40 to 50 per cent. Elimination of the master clutch and gear shifting results in easier operation. Rolling speeds from 0.8 to 5.5 mph are available. Engine braking power on downhill grades is reported to be smooth and effective.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 275.

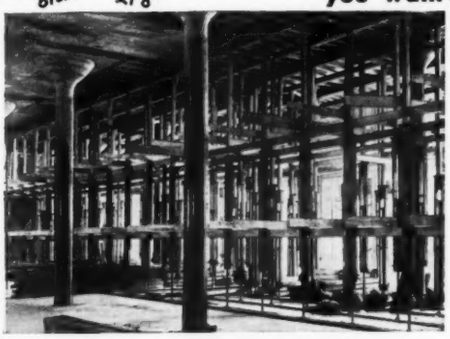
Leschen names Dougherty

The new district sales representative for Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis, Mo. is Pat E. Dougherty. His territory consists of the state of Washington, western Idaho, and northwestern Montana. Mr. Dougherty, a civil engineer for 15 years, has been a representative for wire rope for the past ten years.



LIKE *Magic*

—the height you want!



the *New* Rooshor —EXTENSION TYPE

For every shoring job . . . regardless of height . . . the new ROOSHOR, *Extension Type*, provides the fast, efficient and economical method. This new ROOSHOR may be used as a flat-head shore, or, by merely inserting any length S4S 4 x 4, as an extension shore or, as a male-head shore . . . *one type shore does all this.* Wooden upper members make it easy to nail bracing when needed. Available in two sizes giving adjustments from 6' to 10'-6" or 8' to 14'.

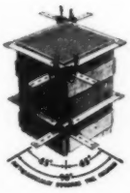
STANDARD ROOSHOR

Instantly adjustable to accurate height—without pins or screws to cause needless delays. Three sizes, giving adjustment from 8' to 14', 7' to 13' and 5' to 9'.

ROOS COLUMN CLAMPS

The job-proven answer to column forming accuracy . . . two identical hinged units . . . no wrong way to put them on . . . no loose parts.

Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities. Write for Bulletin 355.



CE.

BAKER-ROOS, INC., P. O. Box 892, Indianapolis 6, Indiana.
Please rush additional information on Rooshors and Roos Column Clamps without any obligation.

Name_____

Company_____

Address_____

City_____ State_____

TO ERECT STEEL FASTER, BETTER

USE HIGH-STRENGTH BOLTS AND MIL-CARB® CARBURIZED WASHERS

BOLT . . . instead of *rivet*. Authorities on Structural Steel Framing Practice say it's stronger, faster, and costs less to BOLT!

BOLT, and save time, erecting buildings or bridges. With modern MIL-CARB carburized washers on high tensile steel bolts you can torque up greater clamping force than is produced by the cooling of rivets. Bolts of same diameter as rivets can be used . . . bolts that have greater strength than comparable rivets . . . bolts that do not demand "scarce" field riveters in structural practice . . . bolts that produce *high strength joints* with 25% greater fatigue resistance than comparable rivet-joints . . . bolts that permit QUIET construction, free from the jarring rat-a-tat-tat of riveting . . . bolts that lower the cost of structural steel jointing that is better in every way!

BOLT your way to bigger profits. Remember, of course, that *no* bolt is any better than its washers . . . and remember, too, that only Prime Carburizing-Quality Special-Soundness Steel is used in MIL-CARB Washers, insuring uniform quality control always equal to the rigid specifications (ASTM Designation A325), applying to nuts, bolts and washers.

MAY WE HELP YOU?

If you have a specific question or a problem pertaining to washers, we shall be glad to give you the benefit of our experience.

Remember: "NO BOLT IS ANY BETTER THAN ITS WASHERS"

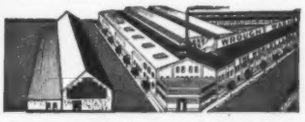
Distributed by Leading Bolt Manufacturers and U. S. STEEL SUPPLY DIVISION

UNITED STATES STEEL CORPORATION
208 South LaSalle Street
CHICAGO 4, ILLINOIS

MILWAUKEE WROT WASHERS

Since 1887

WROUGHT WASHER MFG. CO.
2118 S. BAY STREET
MILWAUKEE 7, WISCONSIN



The World's Largest Producer of Washers

Equipment for making electric vibrating screed

■ All the components for making an electric vibrating screed are included in a package assembly available from Stow Mfg. Co., 40 Shear St., Binghamton, N. Y. By mounting this equipment on a beam, the contractor can make a finishing screed that will strike off concrete smoothly while vibrating it. This type of screed, pulled along by two men, is used extensively on concrete bridge decks, airport aprons, floors, and roadways.

The electric screed equipment consists of a 1-hp electric motor with a thermo overload switch and a cord with complete twist-lock plug. The motor powers a vibrating unit that delivers 5,100 vibrations per minute.

This electric vibrating screed can be assembled from components supplied by Stow Mfg. Co.

Also included are brackets for mounting the motor to the beam, a pair of end rollers, handles, and all necessary bolts.

For many jobs, this screed equipment can be bolted to any beam. However, for slabs which must have a perfectly flat surface, a prestressed screed beam is recommended. This beam can be ordered from the manufacturer, or the manufacturer will supply complete drawings and directions for building the screed beam. These instructions are given on the reverse side of Stow's Catalog No. 552.

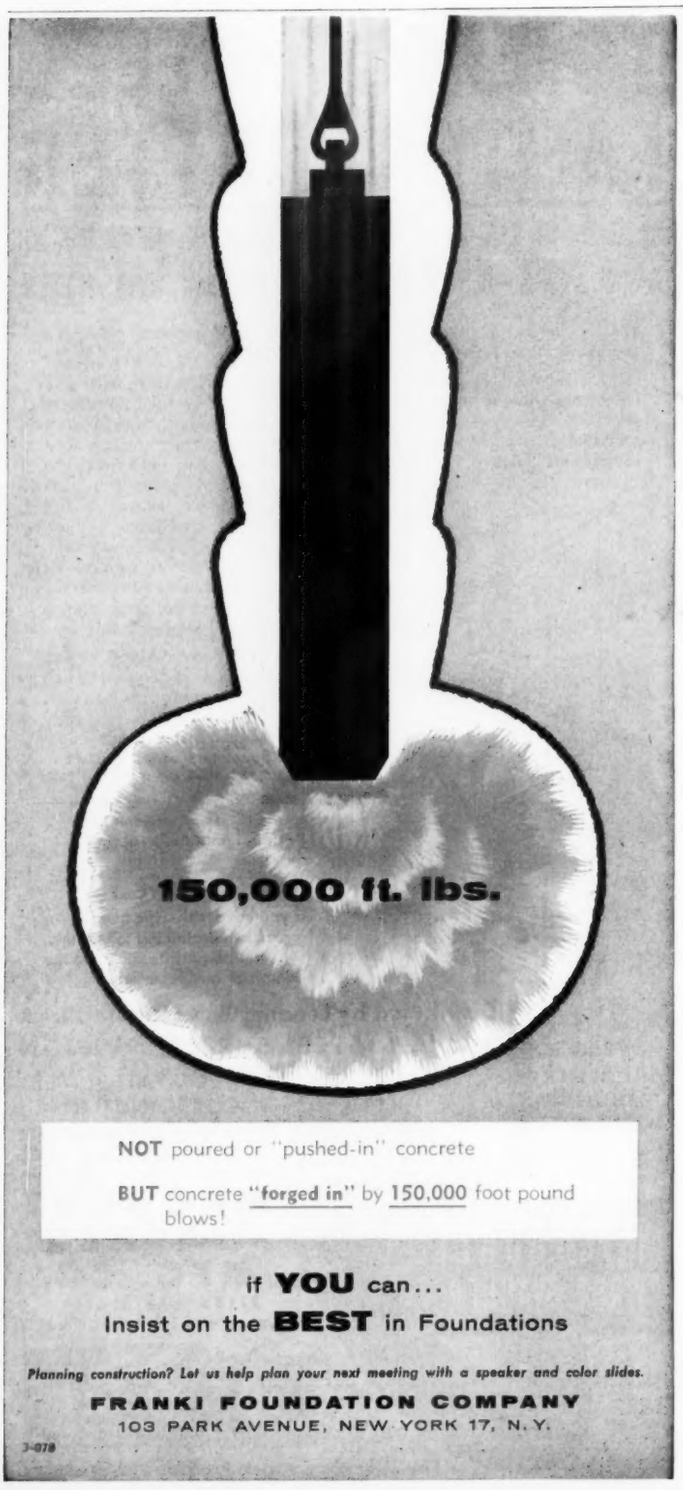
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 332.

Use of air-operated tools for fastening nuts and bolts

■ A new catalog which is devoted entirely to the problem of running nuts, bolts, cap screws, and other types of fasteners is available from Ingersoll-Rand, 11 Broadway, New York 4, N. Y. The literature shows how air-powered Impactools may be used to reduce fastening costs.

Also included are descriptions of the complete line of these tools, with a two-page spread devoted to each size. Illustrations, specifications, application pictures, and case-history studies provide full details.

To obtain Form 5200-A write to the company, or use the Request Card that is bound in at page 18 of this issue. Circle No. 333.



NOT poured or "pushed-in" concrete

BUT concrete "forged in" by 150,000 foot pound blows!

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Insist on the BEST in Foundations

Planning construction? Let us help plan your next meeting with a speaker and color slides.

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Portable • Permanent • All-Steel

BUILDINGS

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Highly versatile, fully prefabricated all-steel buildings by USF offer full 26′ or 30′ span without central columns and wide diversity of wall treatments, including sliding doors and various window and access door combinations to meet specific requirements. Easily insulated and skylighted or roof ventilated. USF also offers 40′ clear span rigid frame buildings for single or multiple use in any length.

FAST, LOW COST ERECTION

100% Portable

All USF Buildings are erected by the patented clip-and-wedge method which eliminates all special tools, screws, or welding. Dismantling is just as easy as erection, which makes them 100% portable. WRITE for complete literature.

United Steel Fabricators, Inc.

WOOSTER, OHIO

The Link-Belt Speeder LS-98 with low-clearance and 1¼-yard rock bucket.

Specialized attachment adapts 1-yard shovel crane for low-clearance loading and bulk-material handling

■ A new loading attachment adapts the Link-Belt Speeder LS-98 shovel-crane for horizontal straight-line loading operations. The Excaloder is interchangeable with the shovel, hoe, dragline, clamshell, or crane of the 1-yard LS-98.

The new attachment features exceptionally low overhead clearance; with standard mast, it requires only 15 feet 10 inches of clearance height. An optional low mast has a minimum clearance height of only 11 feet 3 inches. Maximum dumping height, with stick extended at 45 degrees, is 16 feet 11 inches. With stick retracted at 45 degrees, it is 11 feet 4 inches.

Tested for 18 months, the Excaloder has proved efficient for loading rock, sand, gravel, and other loose materials, according to the manufacturer. The attachment is operated by the LS-98 Speed-o-Matic controls, which provide power-hydraulic fingertip control of all functions. The Excaloder operator can control the dumping speed of the bucket, saving wear and tear on truck bodies. The bucket closes automatically when the dumping lever is released, or can be held in open position for grading by toggling the control lever into fully open position.

The Excaloder employs a straight-line bucket action. This motion makes the unit particularly valuable for grading and cleanup or loading from stock piles. An independent-chain-crowd arrangement provides positive crowding and retracting and reduces maintenance and downtime. The bucket can also be tilted to the dump position and used for cleanup dozing.

For further information write to Link-Belt Speeder Corp., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 217.

Jaeger personnel news

The new assistant general sales manager of Jaeger Machine Co., Columbus, Ohio, is A. C. Thomas. Associated with sales promotion and sales at Jaeger since 1940, Mr. Thomas has served as sales manager of the truck-mixer division since 1948.

Emil L. Baugh succeeds Mr. Thomas as truck-mixer sales manager. Mr. Baugh's former post as Southeastern sales representative will be assumed by R. E. Fowler.

New 2-way radio has sectionalized design

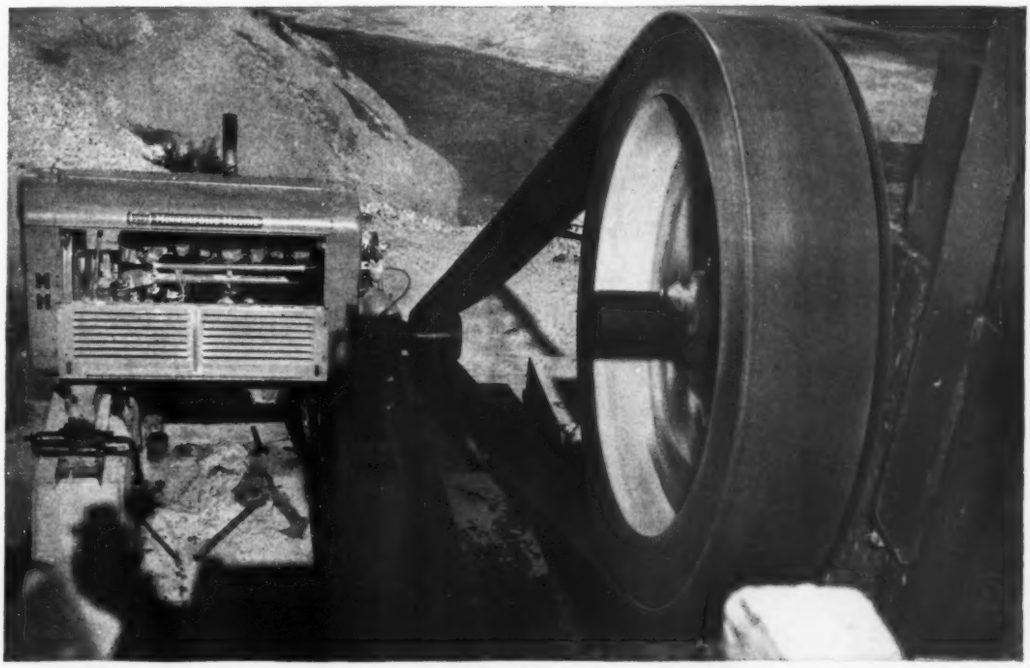
■ New two-way radio equipment which incorporates sectionalized chassis and other design features for more efficient and economical operation and maintenance has been placed on the market by the Engineering Products Division, Radio Corporation of America, Building 15-1, Front and Cooper Sts., Camden 2, N. J. The equipment is designed for operation in the 450 to 470-megacycle band.

The new Carfone-450 includes a 15-watt mobile FM radio for installation in trucks and other vehicles, and a 15-watt FM desk-mounted unit for base station operation. Both units carry FCC type approval for use in the Class A Citizens Band Radio Service.

Transmitter, receiver, and power supply are designed as separate independent units and assembled in a single case. This separation permits change of units for maintenance, and enables user to substitute new developments in equipment.

Both the mobile radio and the desk equipment are engineered for frequency stability of 0.001 per cent without ovens. Both feature high-efficiency loudspeakers, and provide "sealed selectivity" through a tamper-proof i-f filter pretuned at the factory and designed in anticipation of wide-to-narrow band conversion.

For further information write to the company, or use the Request Card at page 18. Circle No. 212.

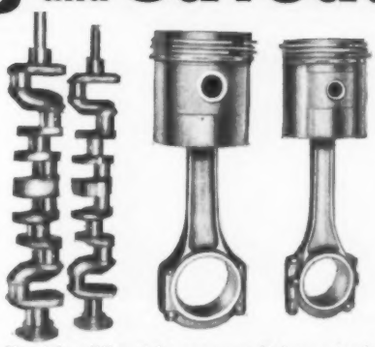


These Crushing Plants Went Shopping and Saved!

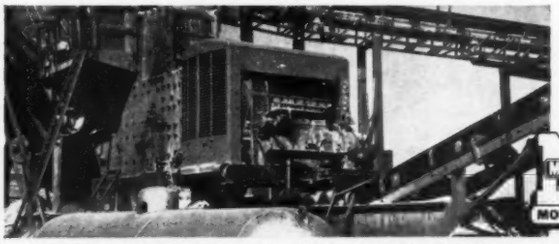
An MM 425-6A LP gas power unit best filled the requirements of this Illinois sand and gravel producer when he went looking for a heavy-duty engine to power roll and jaw crushers. His objective was to get

- a factory equipped engine for lowest cost fuel
- low fuel consumption at maxium power and load
- minimum down time and maintenance
- convenience of installation and operation.

The 425-6A more than filled the bill because MM engines are fully and separately designed for gasoline, LP gas, natural gas, diesel, or distillate—MM high turbulence combustion and ample displacement result in high torque at low rpm—long-run features like MM vacuum crankcase ventilation and improved oil filtering require less service—available equipment includes selection of power take-off drives, couplings, rotation and speeds—partial or full enclosures—radiator or cooling coil—choice of location for controls and instruments—electric starter and generator—water-cooled manifolds and heat exchanger jacketed base pan.



Here is how MM part size goes up as displacement and hp go up to supply heavier construction necessary for continuous heavy load operation. Crankshaft, connecting rod, and piston of MM's 108 hp 605-6A engine are shown side by side with those of the next larger MM engine, the 148 hp 800-6A. Size and weight where it counts does the job longer and without strain.



Minneapolis-Moline engines are available from 29 hp to 291 hp, can be outfitted for specialized applications meeting all original equipment and replacement requirements within size ranges. Specifications and engineering service available on request.

MINNEAPOLIS-MOLINE
INDUSTRIAL DIVISION
MINNEAPOLIS 1, MINNESOTA

The 6-ton Dixie crane features a low center of gravity.

Six-ton crane features stability and dependable hydraulic system

■ A new 6-ton crane designed with a low center of gravity for exceptional stability has been announced by Dixie Crane & Shovel Co., Inc., 2343 N. 7th St., Harrisburg, Pa. The machine also features a new hydraulic control system that sharply reduces downtime.

The new Dixie crane has all drums on the same level to give it the extra stability required for an unusually wide range of material-handling jobs. Available on a rubber-tire crane carrier, the unit can also be mounted on any 2½-ton truck or on 20-inch crawlers.

The machine's hydraulic system includes a master cylinder for each working part, so that the crane can never be put out of action because of central booster-pump failure. In addition, the operator has the feel of the load at all times.

The Dixie crane is equipped with a standard 25-foot boom. Five and 10-foot boom inserts are available, as well as a 15-foot jib and high gantry for long boom work. Only one operator is required for all operations.

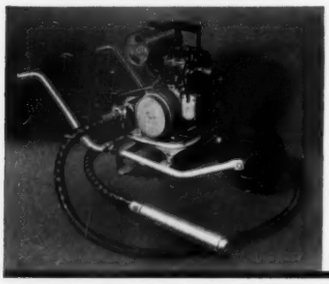
More than 16 different types of attachments are available for the machine including single slings; bridle slings; hairpin hooks; special hooks, tongs, grabs, grapples; and magnets and various buckets and tote boxes. The Dixie crane can also be used with a clamshell or dragline for handling bulk materials or excavation.

Maintenance economy is another feature of the new crane. All clutches are interchangeable. The hydraulic system has no linkages, and this is said to give up to 75 per cent more clutch wear. The cab can be completely removed by loosening only 12 bolts, and routine maintenance on the equipment can be done in the average plant maintenance shop.

Mounted on a crane carrier, and equipped with a 25-foot boom, the Dixie crane weighs 20,860 pounds. It moves on the road at full truck speed and is reported to be extremely maneuverable, even in tight places. The standard power unit is an International Harvester V-162 gasoline engine, but either a Continental F-162 40-hp gasoline engine or a diesel power unit is available on order.

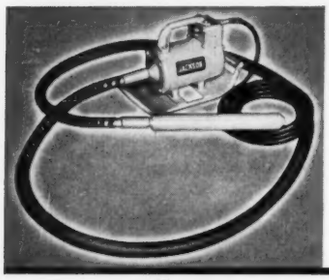
For further information write to the company, or use the Request Card at page 18. Circle No. 285.

JACKSON THE NAME *that* SIGNIFIES THE BEST IN VIBRATORY EQUIPMENT!



FOR GENERAL CONCRETE CONSTRUCTION

MODEL FS-6A — a 6 H.P. engine driven, flexible shaft vibrator with plenty of reserve power for fast action and continuous, reliable service. Excellent for both thin and thick sections. Vibratory frequency may be varied to suit conditions.

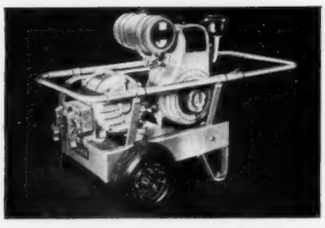


FOR GENERAL CONCRETE CONSTRUCTION

MODEL FS-150A — a 2½ H.P. electric vibrator for light socket operation. Handy as a pocket in a shirt. Powerful enough to handle practically all general construction concrete vibration with shafts up to 28′. Especially good for high places.

FOR MASS CONCRETE CONSTRUCTION

MODEL VS-4. This vibrator has no rival in economically and efficiently placing mass concrete in dams and similar construction. It has a very impressive record of performance on a majority of large dam projects in this country, and many abroad.



DUAL CURRENT PORTABLE POWER

for operating all JACKSON Vibrators, power tools and lights. Models from 2.5 to 7.5 KVA, providing both single and 3-phase 60 Cy., 120 V, AC (120/240 V in larger models). Permanent magnet generators require no adjustment or maintenance.

CONSULT YOUR JACKSON DISTRIBUTOR OR WRITE TO US ON ANY VIBRATORY PROBLEM

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON, MICHIGAN

DUDGEON HYDRAULIC JACKS

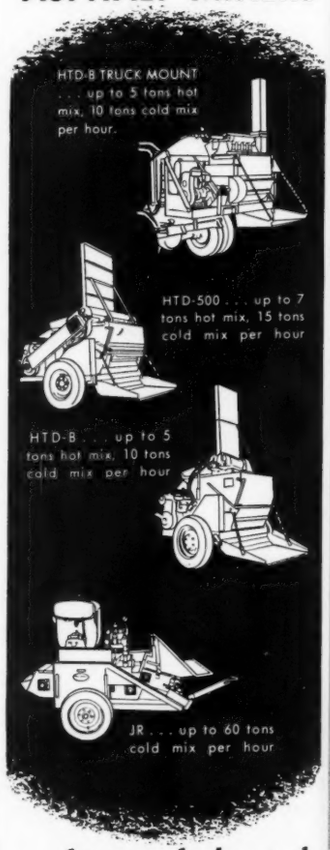
SALES RENTALS

CAPACITY TO 600 TONS

FOR:
PILE TESTING
UNDER-PINNING
BRIDGES
PIPE PUSHING
SOIL TESTING

RICHARD DUDGEON INC. EST. 1850
789 BERGEN STREET BROOKLYN, N. Y.
• ST 9-4040 •

McConnaughay **ASPHALT MIXERS**


HTD-B TRUCK MOUNT . . . up to 5 tons hot mix, 10 tons cold mix per hour.
HTD-500 . . . up to 7 tons hot mix, 15 tons cold mix per hour
HTD-B . . . up to 5 tons hot mix, 10 tons cold mix per hour
JR . . . up to 60 tons cold mix per hour

. . . for resurfacing and patching in any season

Designed for economy of operation and fast production, the McConnaughay line of Asphalt Mixers meets every need for most resurfacing as well as all types of pavement patching. Working on location, McConnaughay HTD Mixers provide the *exact amounts* of materials needed and effectively remove both moisture and solvents from bituminous mixtures . . . positive assurance that patches and resurfaced areas will set up hard. For details and specifications on the mixers above and on the JR and HTD-LP models (not illustrated), write, wire or 'phone . . .

ASPHALT EQUIPMENT CO., INC.
3929 Buell Drive, Fort Wayne, Indiana
National distributors for K. E. McConnaughay, Lafayette, Ind.

This new rear-mounted scoop for Ford tractors handles up to 7 cubic feet of material.

Tractor-mounted scoop

■ A new rear-mounted reversible scoop designed to handle a wide variety of material-handling and earth-moving jobs has been announced by the Tractor & Implement Division, Ford Motor Co., Birmingham, Mich.

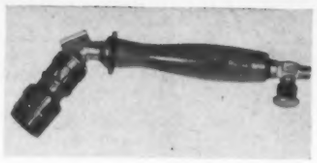
The scoop, which attaches to the three-point implement linkage of any Ford tractor, carries up to seven cubic feet of earth. Of heavy and welded-steel construction, the new scoop has a high-carbon-steel tapered cutting edge.

The digging depth of the Ford scoop is 6 inches. Over-all length is 33 inches, width is 34 inches, and height is 47 inches. Transport clearance in the level position is 20 inches.

All operations of the new scoop are controlled from the tractor seat. Dumping and re-setting of the scoop are done through a mechanical trip lever. The scoop can be held in a vertical position for leveling operations. Raising and lowering of the scoop is accomplished through the Ford tractor's built-in hydraulic system.

Among the operations that can be performed with the scoop are ditch digging, excavating, back loading, backfilling, and leveling. The attachment can also transport stone, cement blocks, bricks, sand, and gravel.

For further information write to the company, or use the Request Card at page 18. Circle No. 221.



The new Insto-Gas No. 6 soft-flame torch.

Soft-flame heating torch

■ A soft-flame torch with maximum capacity of 150,000 Btu per hour is now available from the Insto-Gas Corp., 1977 E. Woodbridge, Detroit 7, Mich.

For certain types of work a large soft flame is more desirable than the hard blast flame usually produced by Insto-Gas torches. The new No. 6 torch is well suited for thawing pipes and for heating sand. It will produce a flame 36 inches long that can be used directly on a sand pile, or to burn inside a pipe covered with sand.

Like all other Insto-Gas torches, the No. 6 lights instantly and burns with a clean flame.

For further information write to the company, or use the Request Card at page 18. Circle No. 206.

IF IT'S A WET JOB

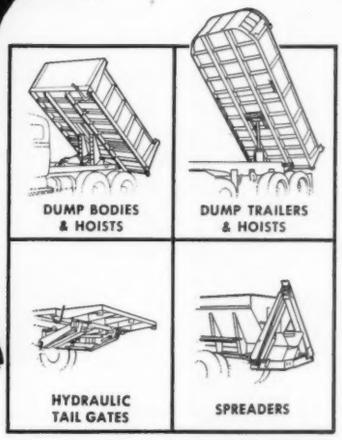
PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

S-M-O-O-T-H A-C-T-I-O-N L-I-F-T... with Power to Spare!

LIGHTWEIGHT HERCULES "SINGLE FRONT-MOUNT" TELESCOPICS GIVE MORE PAYLOAD PER TRIP!



Three new models (11, 16 and 20 tons, capacity) *legally* permit an extra 1000-1500 pounds additional payload per trip, with bodies from 10 to 15 feet long! Hercules TELESCOPICS weigh less—put more load on the front axle . . . permit additional payload . . . reduce hauling cost per ton . . . result in more profit for you!

HERCULES SINGLE FRONT-MOUNT TELESCOPICS ARE THE STANDARD OF THE INDUSTRY!

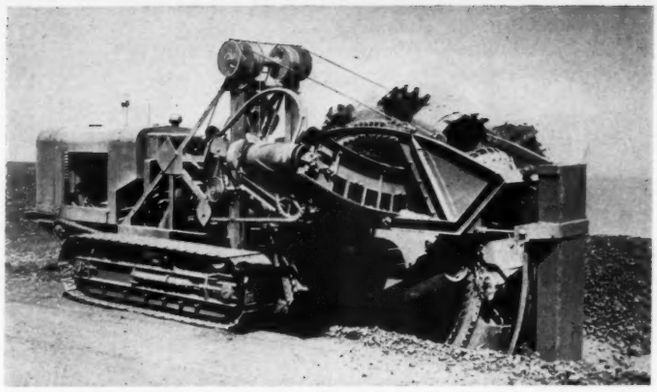
Better Weight Distribution
Increased Capacity
Improved Dumping Stability
Safer Operation
Less Maintenance
More Payload

HERCULES 1905 1955 50th ANNIVERSARY

UNISTEEL BODY CO., *A Division of Hercules, producers of Standard and Custom Van Truck Bodies* 5502

Buy from the line of strongest design • HERCULES STEEL PRODUCTS CORPORATION, GALION, OHIO

Excavator wheel speeds and traction speeds are independent of each other in the new Buckeye Model 308 ditcher. ►



Ditcher has independent digging-wheel control

■ A new pipeline and utility ditcher has been announced by Gar Wood Industries, Inc., Wayne, Mich. The heavy-duty wheel-type ditcher is especially designed for digging cross-country ditches, and for city gas, water, oil, sewer, conduit, and cable lines. It digs to a maximum depth of 5 feet 6 inches and has a width of cut varying from 16 to 32 inches.

A hydraulic hoist, operated by simple one-hand controls, positions the digging wheel. Lowering and raising of the digging wheel is completely independent of digging wheel or crawler speeds. Furthermore, hydraulic drive eliminates shock damage to the soil discharge conveyor.

Forward and reverse belt drive is provided in a selection of three speeds. Variation in tread width and bearing area for the tractor-type crawlers is obtained through a selection of tread pads. Ground-bearing pressure with standard 16-inch tread shoes is a maximum of 5.6 psi. A separate clutch and separate brake for each crawler is provided in the final drive transmission, giving independent power to each crawler.

The Buckeye 308 ditcher has 16 digging speeds forward, ranging from 0.80 to 19.10 feet per minute. Excavator-wheel speeds and traction speeds are entirely independent of each other. A high-low range shift allows fast speed-up or quick slow-down in digging travel without clutching the engine or stopping the digging wheel.

For further information write to the company, or use the Request Card at page 18. Circle No. 216.

All-steel roofs offered for clear-span structures

Brookville all-steel roofs are available in standard spans of 40, 48, 60, and 80 feet.

■ A complete line of pre-engineered all-steel insulated roofs for use on buildings with masonry or steel sidewalls is available from Brookville Mfg. Co., Brookville, Pa. Insulation provided may be either Fiberglas or Homosote.

The roofs are designed for clear span structures, and are furnished in standard spans of 40, 48, 60, and 80 feet. According to the manufacturer, they meet AISC code requirements, being designed for 30-pounds-per-square-foot live loading and 20-pounds-per-square-foot wind loading. They can be furnished with ventilators, louvres, and plastic skylights.

For further information write to the company, or use the Request Card at page 18. Circle No. 268.

Sizing screen features new vibrating mechanism

■ A new Hewitt-Robins vibrating screen for screening and sizing bulk materials is reported to operate more efficiently than conventional types on 50 to 75 per cent less power. With fewer wearing parts, the new screen is also more economical to maintain.

These improvements are the result of the use of a unique system of rubber and steel springs upon which the screen frames are mounted. Controlled resonance induced by a relatively small mechanical exciter produces the vibrations that separate materials according to size. The powerful vibrations are reported to have overcome the annoying problem of screen surface clogging.

All vibration is contained within a dynamically-balanced system designed to reduce energy losses. This enables operation with smaller and lighter drives and motors.

According to the manufacturer, the Hi-G screen is the first such equipment made in this country to utilize the principle of modified resonance. It will be made in various sizes ranging from 4×10 to 6×28 feet.

For further information write to Hewitt-Robins Inc., 666 Glenbrook Road, Stamford, Conn., or use the Request Card at page 18. Circle No. 300.

Rolatape THE MODERN, MOBILE MEASURING INSTRUMENT

FOR LOW-COST, ACCURATE MEASURING

Model "400"

MODEL "400" This Model is a favorite and is widely used by Telephone Companies and other Utilities, paving contractors, land appraisers, etc. It's four-foot circumference measuring wheel makes it most suitable for measuring fairly rough terrain. Automatic measuring counter can be reset at any distance. Folds compactly.

MODEL "200" A popular Model for interior and exterior use. Tabulates wall-to-wall, vertical, or a 101 other measuring assignments. Folds compactly for kit or glove compartment.

MODEL "600" For cross country acreage measurement and work on rougher terrain.

NOTE—All Rolatape Models are designed to tabulate accurate measurements, and are constructed for long and dependable service. With Rolatape, you measure as you walk.

FOR COMPLETE ROLATAPE INFORMATION AND PRICES PLEASE WRITE

ROLATAPE, INC.
1741 14th Street, Santa Monica, Calif.
OR SEE YOUR LOCAL DEALER

TOP PERFORMER

McKISSICK
SPEED NUT
SNATCH BLOCK
Is quick and safe

Eliminates all lower bolts facilitating easy opening and closing.

Two quick turns of "speed nut" and block is ready to open or close.

"Speed nut" is never completely removed and cannot be lost.

McKissick Builds A Better Block For Every Purpose.

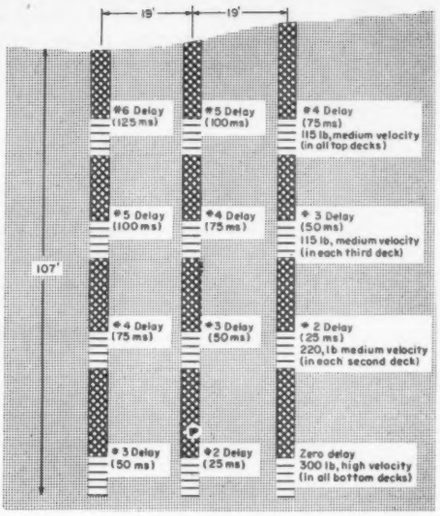
Catalog on Request

McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

One full second after the blast has been set off, the entire burden is falling downward and outward, the lower section leading.

Delay firing of decked charges, which reduces vibration, is shown in the loading and firing pattern being used successfully by the Union Building & Construction Co., at its Clifton, N. J., quarry.


15'
15'
#6 Delay (125 ms)
#5 Delay (100 ms)
#4 Delay (75 ms) 115 lb. medium velocity (in all top decks)
#5 Delay (100 ms)
#4 Delay (75 ms)
#3 Delay (50 ms) 115 lb. medium velocity (in each third deck)
107'
#4 Delay (75 ms)
#3 Delay (50 ms)
#2 Delay (25 ms) 220 lb medium velocity (in each second deck)
#3 Delay (50 ms)
#2 Delay (25 ms)
Zero delay 300 lb. high velocity (in all bottom decks)

Unique blasting system is inoffensive in residential area

Power in four decks breaks blast into small units, confines gases, and produces little flying rock

Profitable quarrying operations are being carried on by Union Building & Construction Co., Clifton, N. J., without complaints from residents in the heavily populated area—largely because of an unusual blasting pattern devised by quarry superintendent Nicholas Van der Kamp.

In shooting three 107-foot holes spaced 19 feet apart and with an 18-foot burden, the company uses 750 pounds of powder—in four equally spaced decks—in each hole. Short-period delay caps, gelatin-cored ammonium-nitrate cartridges, and adequate stemming produce effective shots, breaking the blast into small successive explosions. The strongest charge, placed in the bottom of the holes, insures that the toe of the burden will be pulled. And since the charge is initiated at the bottom, gases are mostly confined, and little air "snap" and flying rock is produced.

The bottom of the four-layer deck contains 300 pounds of Atlas Apex #4HV, which has a velocity of 17,000 feet per second, and the second deck contains 220 pounds of Apex #2MV, which has a velocity of 15,000 feet per second. Six charges of Apex #2MV are in the top two decks.

These 12 separate charges are set off by Atlas Rockmaster millisecond delay caps, arranged to direct the throw downward toward the floor of the quarry. Delays 0, 2, and 3 are used in the bottom decks; delays 2, 3, and 4 in the second decks; delays 3, 4, and 5 in the third decks; and delays 4, 5, and 6 in the top decks. These caps provide a total delay time of 125 milliseconds between the first and last charge, and 25 milliseconds between succeeding charges. All three holes are stemmed between charges, and about 18 feet of stemming tops each hole. THE END

COMFORT KEEPS HATS ON—

ANY safety hat protects the wearer *only* while it is worn. The GENTEX safety hat is specially engineered for maximum comfort to assure *full time* wearing for *full time* protection.

Only the GENTEX has a resilient, contoured plastic headband that shapes itself to the head, exerting no pressure even after a full shift's wear. It's lightweight . . . and cool even under the hottest sun.

It *really* protects! Tough GENTEX safety hats exceed all Federal specifications as well as standard mechanical, electrical and fire tests for protective headgear.

If you want to safeguard your men with a hat they'll *like* . . . and *wear* . . . give them GENTEX. Write for the complete story about these remarkable safety hats! Do it NOW!

General Textile Mills, Inc.
450 Seventh Ave. — N. Y. 1, N. Y.

JERSEY SPREADER
on another Major Project!

OHIO TURNPIKE

With the overload of material shown above, this Jersey Spreader made a smooth, even spread—without hand work or delay—on an Ohio Turnpike Contract. Capacity to lay up to 5,000 tons of base daily has made Jersey Spreaders preferred equipment on big paving contracts.

Write now for complete information and illustrated literature.

TRACTOR SPREADER COMPANY
MANUFACTURERS OF THE JERSEY SPREADER
HASBROUCK HEIGHTS, NEW JERSEY

NOW A SAFER FASTER MORE RUGGED SNATCH BLOCK

THE NEW LEBUS "TRUCKER'S" SNATCH BLOCK

Undoubtedly the Finest Snatch Block ever designed, constructed and presented to the industry. This new LeBus Block has been *engineered for all types of heavy trucking, construction and rigging work. Special emphasis* has been placed on *STRENGTH, SAFETY and EASE OF OPERATION.* Only TOP QUALITY carbon and alloy steels are used in the construction and all parts are drop forged, heat-treated and processed to withstand the most rugged service. Like previous LeBus blocks, the new "Trucker's" Snatch Block requires no tools other than your hands, and can be taken completely apart within a matter of seconds.

For more information write direct or have your supply source write for catalog page 1300 for complete information on the four sizes of LeBus Blocks.

LEBUS

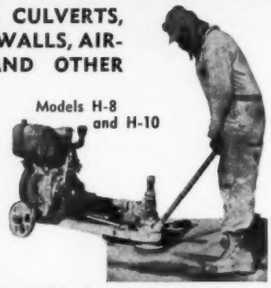
LEBUS ROTARY TOOL WORKS, inc.
Phone Plaza 9-2771
P. O. BOX 2352 • LONGVIEW, TEXAS

"BERG" CONCRETE SURFACERS

FOR BRIDGES, DAMS, CULVERTS, HIGHWAYS, FLOORS, WALLS, AIRPORT RUNWAYS, AND OTHER APPLICATIONS

Models H-8 and H-10

Portable Model A



"BERG" for Quality Work at Low Cost

MODEL A. Lightweight, electric powered unit . . . suspends from operator's shoulder. Interchangeable heads and attachments for surfacing concrete buildings, bridges, dams, walls, culverts, etc. *MODELS H-8 and H-10.* One-man gasoline engine powered units for surfacing concrete highways, streets, floors, airport runways. Includes exclusive power take-off for attaching "BERG" flexible shaft equipment for surfacing bridges, walls, etc. Write today for descriptive literature on machines and attachments.

THE CONCRETE SURFACING MACHINERY COMPANY
4665-69 Spring Grove Ave., Cincinnati 32, Ohio

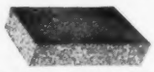
SERVICISED PRODUCTS for CONCRETE STRUCTURES

Dams and Floodwalls, Sewage Treatment and Water Filtration Plants

In general these products are specially designed for structures which control or contain water. Preformed joint fillers used in conjunction with rubber waterstop fill and seal expansion or construction joints so effectively that considerable hydrostatic pressure on one surface of the structure is not allowed to come through the joint.

EXPANSION JOINT FILLERS

CORK Premolded Joint Filler has a high recovery factor (95%) after compression — is non-extruding and inconspicuous in mass concrete structures. Keeps the joint filled at all times.



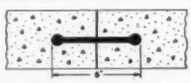
SELF-EXPANDING CORK is specially treated to expand to 150% of original thickness to insure positive joint filling where concrete shrinkage problems are present. Non-extruding . . . and resilient.

SPONGE RUBBER CEMENTONE Gray color blends with concrete. Fully resilient, non-extruding. Uniform thickness and density. Supplied in various degrees of compressibility to meet your requirements.

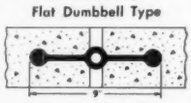
RUBBER WATERSTOP

Servicised Waterstop is flexible and elastic, with a very high tensile strength — easy to install and once in place withstands contraction, expansion and shearing movement to insure a positive permanent watertight seal against hydrostatic water pressure.

Two types — Flat Dumbbell and Hollow Bulb. Both types meet all standard engineering specifications. Waterstop also available in fabricated ell's and tee's.



Flat Dumbbell Type



Hollow Bulb Type

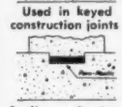
NEW! SPLIT DUMBBELL TYPE

Servicised Split Type Waterstop spread open and nailed to inside of bulkhead. This eliminates slotting — saves time and labor.

Saves time, labor — eliminates split bulkheading. One half of waterstop width is split to permit fastening to bulkhead to form a "T" (see illustration). After pour, bulkhead is stripped, and divided section joined by stapling or with rubber cement. Also lower cost field splicing using Servicised Union.

MOLDED PARA-PLASTIC

Used in keyed construction joints

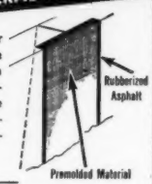


Sealing at footing.

Bituminous rubber seals keyed contraction or construction joints, in vertical walls. Applied by heating surface. Adheres to concrete to form resilient, moisture-tight seal.

PARA-LATERAL STRIP

For sealing exterior vertical construction or expansion joints in walls, tunnels, foundations, etc., where joints must be protected against seepage from backfill.



Write for catalog describing the complete Servicised line and the special brochure on Rubber Waterstop. Sent without obligation.

SERVICISED PRODUCTS CORPORATION
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

The 60-foot trusses and other materials are raised to the roof by a small truck crane. Timber uprights through the center of the building support one end of the trusses.

Ray Day Photos

Low-cost construction with tilt-up method

At a cost of less than $4.50 per square foot, Andersen-Westfall Co., Inc., Portland, Oreg., completed the new $150,000 Portland headquarters and sales office of tilt-up construction for Massey-Harris-Ferguson, Inc., Racine, Wis. The 33,600-square-foot facility, located at 8450 N. E. Killingsworth St. in the important Pacific Northwest city, has sidewalls of tilt-up concrete slabs which were cast on a 5-inch reinforced-concrete floor slab, then hoisted into position. The roof of the modern building is of timber-truss construction.

Twenty 60-foot-span bowstring trusses, furnished by Timber Structures, Inc., Portland, support the dual-domed roof. Timber uprights, which run in a single row down the center of the building to support one end of the roof trusses, were also furnished by Timber Structures.

Starting December 1, 1954, the contractor geared work for rapid and efficient production to meet the April

ANNOUNCING . . . The most revolutionary achievement in ARC WELDING equipment in years!

BREN-WELD MODEL 200 AW

Dimensions: only 11" x 12" x 7½"

Weighs only 65 lbs.... Carry it to the job!

Patent Pending

FIRST TRULY PORTABLE 200 AMP. OUTPUT ARC WELDER

OBSOLETES ALL OTHER WELDERS OF COMPARABLE RATING

List Price $169.50 F. O. B. Long Island City, N. Y.

Sensational new transformer development produces far more power to pound! The BREN/WELD does work of conventional welders 4 or 5 times its size and weight . . . Actually delivers up to 250 amps at reduced duty cycle.

Simple to use, fully guaranteed, it operates on 110/220 volts AC, 50/60 cycles; handles electrodes from 3/64" to 5/32". Has adjustable arc voltage for different arc characteristics. Ideal for plant production and maintenance, for construction work, railroads, on the farm or home.

See your dealer or write direct for details of free trial offer!

24 hour delivery from stock!

KASSON

Manufactured by BRENNEN, BUCCI & WEBER, INC. New York City

SALES DIVISION
KASSON DIE & MOTOR CORPORATION
Integrity Since 1919
32-14 NORTHERN BOULEVARD, LONG ISLAND CITY 1, N. Y.

Panel erection of building proves economical; timber bowstring trusses support dual-dome roof

15 completion date. After the site had been graded, initial concrete footings and the floor slab were placed by truck mixers operating between the site and the nearby Island Sand & Gravel Co. plant. The slab received surface vibration from Jackson vibrators and was finished by a cement-finishing crew with Whiteman power-trowel equipment. Techkote Tilt-Crete, a combination curing and separating compound, was used in areas where tilt-up slabs were to be constructed.

Setting slabs

Side forms for these slabs consisted of 2×6 timbers. The forms were laid out so that each panel could be reached by the truck mixers. After the tilt-up slabs had been cast and were ready to be lifted, they were hoisted into place by a Lorain truck crane. Special reinforced-concrete haunches, built for the end support of the Timber Structures laminated trusses, were set as soon as the tilt-up slabs were finished.

A smaller truck crane was used to raise the timber trusses and to hoist the various bundles of 2×12 Douglas fir purlins and sheathing which form the main support for the roof. The weatherproof part of the roof is a four-ply layer of tar and felt.

Andersen-Westfall Co., Inc., contractor on the low-cost project, is a firm specializing in this increasingly popular type of industrial building. Right now, the firm has eight such buildings under construction and two more under contract. THE END

As soon as tilt-up panels for the new 33,600-square-foot warehouse have been set and temporarily secured, wood trusses supplied by Timber Structures, Inc., are erected for the roof.

MIX and PAVE—
all in ONE operation!

THE BURCH MODEL 12 PAVER and RESURFACER

Write Dept. CE for Literature.

Mixes, spreads, and levels bituminous material 10 to 12 feet wide in ONE pass. Material is rolled and mixed FOUR times. Easily adjusted to spread uniform thicknesses over varying contours. Wheel base is 22' 10". The Burch Paver is tractor-pulled — but its operation is hydraulically controlled, with power supplied by a self-contained gasoline engine.

The BURCH Corporation
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS
CRESTLINE, OHIO, U.S.A.

Loads
10 TONS
every 60 seconds

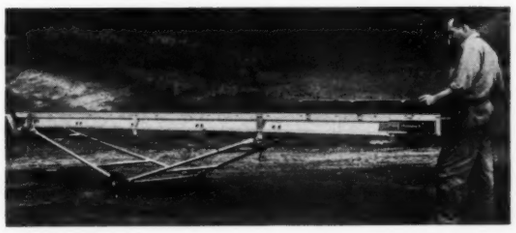
Nelson's new B-68 is the heaviest, toughest most powerful loader you can buy! . . . It's a big machine, because it is built specifically to speed up the working cycles of the largest trucks . . . It will pour 10 tons of material per minute into the truck, distribute it evenly from front to rear, eliminate 'jockeying' under the chute, all in one smooth, continuous operation—*under the control of one operator!*

The B-68 is rugged—stands up under hard, day after day usage . . . Moves over the road at 20 m.p.h. . . . Pays off in profits because no other machine can load as fast . . , Practical if you load only 1,000 tons per day yet *can handle 3 times that amount all day every day!* Check these features—no other loader can match them:

WEIGHS 38,000 LBS. • 115 H.P. ENGINE • 4-WHEEL DRIVE • HYDRAULIC CROWD
FULL POWER STEERING • HYDRAULIC CONTROLS • 20 MILE PER HOUR ROAD SPEED

New Nelson **B-68**

NELSON
N. P. NELSON IRON WORKS, INC.
CLIFTON, NEW JERSEY



Multi - Purpose Aluminum Frame Conveyor

TROUGHING OR FLAT BELTS —
BELT WIDTHS — 6" - 8" - 10" - 12" - 16"
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The new Barber-Greene Model 702 ditcher.

Small ditching machine built for hard service

■ A small Barber-Greene ditcher just announced is comparable to larger machines in its ability to work under adverse conditions, according to the manufacturer. The over-all width of the ditcher is less than 36 inches, and its weight is under 2,000 pounds. It can be hauled in the bed of a light truck, or towed at speeds up to 45 mph.

The Model 702 ditcher can dig the size of trench needed for small building foundations; gas, electric, and water lines; and many types of underground cable installations.

The machine can be equipped with either of two digging booms. One boom digging 30 inches deep operates with either a 2¼ or 4½-inch bucket line. The other, digging 40 inches deep, uses 2½ or 5-inch lines. Switching from one digging width to another is reported to be so simple that one man can do it in less than 20 minutes.

The bucket line consists of a series of replaceable heavy steel cutters, bolted to a steel roller chain. While the bucket line is designed for use under severe operating conditions, it is reported to be so low in cost that the entire line can be replaced economically when the teeth become worn.

The digging boom may be set and locked at the desired depth, requiring no further attention from the operator. The angled construction of the ditcher's boom permits digging under sidewalks and right up to house foundations, minimizing the amount of hand work required on the trench. A simple system of rotating paddles and plows places the spoil at the edges of the trench, facilitating backfilling and eliminating the need for a cross conveyor.

For further information write to Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 262.

P&H sales manager

James C. Huntington has been named district manager in the New York City office of Harnischfeger Corp., Milwaukee, Wis., for sales of P&H power cranes and shovels.

Optical-plummet transit with shifting head

■ The optical plummet principle has been adapted to the American transit by W. & L. E. Gurley, Troy, N. Y. The new Gurley Model 57-FRH-20 transit provides the advantages of optical-reading theodolites, although it will sell for less than the imported instruments.

The new version of the Gurley Hell Gate transit also features a shifting center which permits movement of the instrument in two directions at right angles to each other, with little disturbance to the level of the plate. The optical plummet is, therefore, operative almost continuously during centering.

Essentially, the optical plummet is

The new Gurley optical plummet transit.

How new principles in PAYLOADER design mean greater production at lower costs with these new model

Penetration

Full engine torque applied throug torque converter and four-wheel-driv gives powerful, sure traction to pen trate hard-digging materials, even unde slippery and loose ground condition Operator can also vary the digging angl of the bucket during penetration to mee any condition.

Pry-out action

Tremendous pry-out force can be exerte when necessary by using the break-ou pads on the ground as a fulcrum fo leverage. Load forces opposing the pry out action are transferred to the groun through the pads instead of to the axl wheels and hydraulic system.

Break-out action

The remarkable new system of buck motion tips the bucket back 40 degre at ground level in a powerful break-ou action that gets heaped loads quick an easy, even in shallow cuts and low pile Tilt-back action can be slow or fast the will of the operator.

a telescope through the optical center of the transit, pointing vertically when the transit plate is level. The reticle in the telescope consists of three concentric circles with lines at right angles leading to the center circle, which is just large enough to match the stake tack of the station point at the ordinary set-up height.

To make observation easier, the plummet telescope is turned at right angles by means of a prism, so that the observer actually looks through the telescope horizontally. Time-consuming leveling while centering over a point is eliminated by the new shifting head.

To set up the new model transit, a plumb-bob plug can be pushed into the tripod, and the bob used for initial rough centering to within a few inches of the station point. When tripod and instrument are nearly in place, tripod bolts are tightened and plate leveled, and the plumb-bob plug removed.

For further information write to the company, or use the Request Card at page 18. Circle No. 225.

Soiltest moves plant

Soiltest, Inc., Chicago, Ill., producer of apparatus for engineering tests of soil, concrete, and asphalt, has moved its manufacturing facilities and offices to a new plant in Chicago. Located at 4711 W. North Avenue, the plant has 20,000-square-feet available for business and manufacturing operations.

Largest of three new tractor-drawn scrapers has heaped capacity of 41 cubic yards

New Wooldridge scrapers have the capacity to utilize the full power of the largest tractors now available.

■ Scrapers with capacities up to 41 cubic yards, said to be the largest standard models available, have been announced by Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Sunnyvale, Calif. The three new tractor-drawn scrapers just introduced also feature new wide-base tires that provide increased flotation and carrying capacity.

Of open-bowl cable-operated design, the new units are large enough to utilize the full horsepower not only of the largest tractors now built, but also of even larger models now being developed.

The Wooldridge Scraper Model OS-300 has capacities of 41 cubic yards heaped, and 34 cubic yards struck. The OS-260 is rated at 35 cubic yards heaped and 30 struck with side extension, or 32.5 heaped and 26 struck without extensions. Model OS-200 with side extensions carries 28 cubic yards heaped and 24 struck, or 26 heaped and 20 struck without extensions.

With the new units Wooldridge now offers a complete line of six models covering a capacity range from 10.5 to 41 yards. The other three models and their capacities are the OS-152, 18 cubic yards heaped and 15.1 struck; the OS-90, 15 yards heaped and 12.2 struck; and the OS-80, 10.5 yards heaped and 8.4 struck.

For further information write to the company, or use the Request Card at page 18. Circle No. 279.

Suggestions for planning concrete plants

■ Suggestions for planning concrete plants for central-mix or transit-mix operations or for the production of concrete products are contained in a new booklet from C. S. Johnson Co., P. O. Box 71, Champaign, Ill. The booklet begins with seven basic steps required to set up, modernize, or expand concrete plants of various types. These steps are illustrated with plan views of several concrete-plant sites.

Illustrations show a variety of existing concrete-plant installations, and just about every type of aggregate-storage bin, batcher, cement-handling and storage equipment, and auxiliary aggregate-handling equipment on the market. Tables include a bin selection guide for plants, and a cement-silo capacity guide.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 336.

Incorporating an entirely new principle of bucket action, these new "PAYLOADER" tractor-shovels deliver more yardage per shift . . . handle heavier digging and are easier and safer to operate than any tractor-shovel of comparable bucket capacity. They pack more horsepower and have longer wheelbases for greater stability and riding comfort. They have easy, responsive power-steering, torque converter drive, 4-speed full-reversing transmissions and powerful hydraulic brakes.

THE FRANK G. HOUGH CO. presents these 2 new "PAYLOADER" tractor-shovels as the finest ever offered in its 35 years of pioneering and leadership in the tractor-shovel industry. So why not set a date and have your "PAYLOADER" Distributor demonstrate.

model HH
1½ CU. YD.

model HU
1 CU. YD.

Stability and balance

You get heaped loads and — most important of all — you *deliver* bigger payloads because the bucket carry position is at full 40-degree tip-back *just off the ground* — low and in-close. The result is minimum spillage plus maximum balance and stability for fast, safe load delivery.

Driver safety, comfort

Underslung boom-arm design and positioning keeps moving members out of operator's reach at all positions. This eliminates the need for safety guards or screens and increases operator visibility. Longer wheelbase and adjustable molded foam rubber seat contribute greatly to riding comfort and ease of operation.

"PAYLOADER" is the registered trademark for tractors and tractor-shovels made by The Frank G. Hough Co. — pioneers and builders of more unit-design tractor-shovels than all other manufacturers combined. "PAYLOADER" units are sold and serviced by the largest, most experienced Distributor organization in the business.

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SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

☐ Send data on Model HH — 1½ cu. yd.
☐ Send data on Model HU — 1 cu. yd.

Name.....
Title.....
Company.....
Street.....
City.....
State.....

A new International 2T-75, working on taxiway grading, loads heavy black soil in a borrow pit with the aid of a Caterpillar D8 pusher.

C&E Staff Photos

Runway extension adapts airport to fighter-base use

Tough grading job in heavy gumbo soil precedes base work and concrete paving

Less than four months after it was started, a 3,000-foot runway extension at Hector Field, Fargo, N. Dak., was completed, bringing the total length of the runway to 8,000 feet. This $517,925 job included 18,275 square yards of 10-inch concrete paving, 34,179 square yards of 9-inch paving, and 171,000 cubic yards of excavation.

Northern Improvement Co., Fargo, contractor on this project, also handled the $623,889 contract for the grading and paving of taxiways and parking aprons to serve the runway and a new maintenance hangar. The maintenance hangar, together with crash-truck station, storage building, and additional facilities, is scheduled to be completed this month by Roel Construction Co., Inc., Fargo, under a $742,899 contract. All this work, part of a program designed to adapt this municipal airport for use as a National Guard fighter-interceptor base, was planned and supervised by the military construction branch of the Omaha District, U. S. Army Corps of Engineers.

Taxiway grading

The airport is situated in the fertile valley of the Red River of the North, an area which for miles around is practically level. Although the grading quantities included in the contract were not large, the heavy black gumbo soil was difficult to work and drainage posed a difficult problem. The job of moving the 210,000 cubic yards of excavation for the taxiway and apron grading, together with the furnishing and placing of 44,000 tons of gravel base, was sublet to William Collins & Sons, Inc., Fargo.

To help improve drainage of the subsoil, Collins installed 17,000 linear feet of tile drain on both sides of the taxiway. A Badger trencher excavated for the tile lines, which at some points were as much as 13 feet below the surface. Collins then moved in a fleet of Tournapull A Roadsters with Caterpillar D8 pushers and dozers to do the grading. A new International 2T-75 scraper powered by a Cummins diesel engine worked for several days near the end of the job.

Stripping the topsoil from the taxi-

Scenes like THIS
are helping reduce insurance costs
on jobs like THIS

Construction view, Folsom Dam, American River, California. Merritt-Chapman & Scott, and Savin Construction Co., both use AJAX Cups and drinking water equipment on this multi-million dollar project.

Cost-conscious contractors on big and little jobs all over the country are using AJAX Cups to get approved safety messages into their workers' hands several times a day, when they're relaxed, receptive, ready to read.

Because they know – and the National Safety Council confirms it – that safety messages *that get read* do help reduce accidents. And a good accident record means lower insurance costs . . . can mean the difference between profit and loss on the job.

A TYPICAL EXAMPLE
(Actual case history from insurance company files)

A steel construction firm in one year paid insurance premiums of $3751. This included a charge, above the manual rate of 10.8%. The next year – despite a 5% increase in manual rate – their insurance cost only $3191 . . . because an active accident-prevention program had earned them a credit of 10%, saving hundreds of dollars in cost!

AJAX® CUPS and Drinking Water Tanks deliver fresh water to workers – mean less time lost on the job. AJAX Cups and Dispensers are also ideal for stationary tanks, barrels, pipeline faucets. 4 oz., 6 oz. and 7 oz. sizes packed imprinted with assorted stock safety messages—or your own message to order.

GET THE FULL STORY—Write us today for this new folder which gives full details on imprinted AJAX Cups and equipment.

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Write for illustrated Bulletin.

way and borrow-pit areas, the big and powerful scrapers stockpiled it for shoulder finishing. They then began excavating borrow material from shallow pits nearby to build the taxiway grade. With each rain, borrow pits, haul roads, and the grade itself became a mass of mud. When the sun came out for a few days in a row, the material dried out and baked hard. Under these extreme conditions, Collins had to move the material, shape it to grade, and compact it to 90 per cent of maximum density at optimum moisture.

Initial compaction by the rubber tires of the heavy scrapers was augmented by a Southwest sheepsfoot roller pulled by a Caterpillar D8 tractor. Water hauled from the city mains in two 1,800-gallon tanks on Ford trucks was used to maintain an accurate control of moisture during finishing operations. As the grade neared completion, pneumatic-tire rollers assisted the sheepsfoot, and the final finishing was done by the rubber rollers alone.

Since there was no sand or gravel in the immediate vicinity, the gravel base material was trucked about 21 miles from a pit in Minnesota and stockpiled at the airport. When the subgrade had been shaped and compacted, the stockpiled gravel was spread on the grade and compacted. An International TD-9 tractor, with a Drott front-end loader having a 1¼-yard bucket, transferred gravel from the stockpile to a fleet of hired trucks. Each load was weighed on a portable scale between the stockpile and the taxiway, and the weights thus obtained became the pay quantities for this material.

The 11-inch base was laid in three courses of 4, 4, and 3 inches. As the gravel was dumped from the trucks, it was spread by a Caterpillar No. 12 motor grader and compacted by the rubber-tire rollers. One of these was a Bros nine-wheel roller towed by a John Deere B tractor. The other was a Bros 13-wheel Wobble Wheel roller pulled by a John Deere A tractor. Each course was spread and compacted in the same manner. Moisture

(Continued on next page)

A load of fill material is spread on the muddy taxiway grade by a Tournapull A Roadster. The taxiway and apron alone required 210,000 cubic yards of excavation.

Gravel base material, loaded into a truck by a Drott front-end loader with a 1¼-yard bucket, will be weighed on a portable scale before it is placed, to determine pay quantity.

you play it **SAFE** with **Safety-Pulls**

Just as important as the time- and labor-saving advantages of Coffing Safety-Pull Ratchet Lever Hoists is the way each one protects your men from injury . . . your equipment from damage. Here's why:

Load cannot slip even if handle is accidentally released — because of dual Ratchet and Pawl principle, developed by Coffing and an outstanding Coffing advantage for over a quarter of a century.

Load is held positively at all times — there is no friction brake to slip or freeze.

Hooks will not break or straighten out.

"Safety-valve" handle will bend before any other part of hoist gives way.

Safety-Pulls are single-chain tested at 100 percent above warranted, rated capacity.

Find out more about how Coffing Safety-Pulls provide extra protection on the job. Write for Bulletin C-SP.

Coffing Safety Pull Ratchet Lever Hoists
2 coil chain models, ¾ and 1½ tons
10 roller chain models, ¾ to 15 tons

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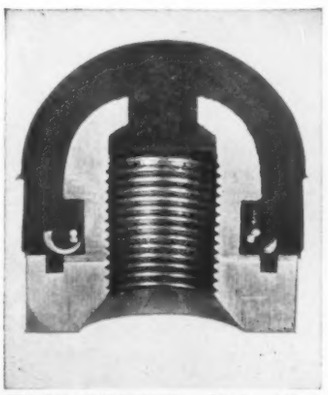


TOUGH, LIVE RUBBER molded on Viber replaceable tip prevents vibrator damage to costly forms.

COILED SPRING around steel base firmly anchors rubber molded completely through and around tip.

Replaceable rubber tips save contractors thousands of dollars

Progressive contractors save thousands of dollars by using rubber tipped vibrators to eliminate damage to forms of plywood and other expensive materials. This means longer form life and less cleanup time. Another important saving is longer housing life because the housing is subject to very little wear, and the tip (where most wear occurs) may be replaced when necessary.

Five years of successful field experience have proved that VIBER'S exclusive patented replaceable rubber tips will stand up under rigorous field conditions. As the result of such experiences, leading contractors like the Robert E. McKee Company have standardized on and use rubber tipped vibrators.

Features Simple Design

Simple design of Viber's patented replaceable tip combines a machined steel base and a molded rubber body. The base, as illustrated above, provides a positive attachment and mechanical interlocking of two parts. This prevents any possibility of the rubber coming off in the field until it is literally torn and shredded away by reinforcing steel or the abrasive action of the concrete itself.

The machined steel base screws directly on the lower end of the housing. It is designed with the same outside diameter as the housing, so the complete assembly is perfectly smooth and will not catch or hang up in the form.

The vibrator does not lose any effectiveness when the rubber finally wears off, since vibration comes from the sides of the housing. Replacement of tip requires only long enough to unscrew the old tip and screw on a new one.

Viber Leads The Field

These patented replaceable rubber tips are another example of the progressive design and planning which keeps Viber a leader in the field of vibration. For information on Viber's complete line of internal and external vibrators, contact your authorized distributor or VIBER COMPANY, 726 South Flower Street, Burbank, California. Dept. 77.

VIBER HOUSINGS LAST two to four times longer because of replaceable rubber tip, which screws on end of housing where most wear occurs. Rubber tip vibrators are available from 1-15/16 into to 3 inch diameter.

VIBER

CONCRETE VIBRATORS SINCE 1931

A course of the 11-inch gravel base is compacted by a Bros 9-wheel pneumatic-tire roller drawn by a John Deere tractor.

(Continued from preceding page)
content was maintained at from 0 to 5 per cent above optimum to obtain the best compaction with the least effort.

Concrete paving

The taxiway, 75 feet wide, was put down in three 25-foot strips. Both taxiway and aprons were paved with an 11-inch concrete slab over the 11 inches of gravel base. To obtain this depth, the contractor attached full 3 × 10 planks to the bottoms of 8-inch Metaforms. A Caterpillar No. 12 motor grader and a pull planer towed by a White army-surplus halftrack shaped the base to true grade inside the forms as an Ingram three-wheel roller compacted the finished surface.

The Koehring 34-E Twinbatch paver leading the paving train operated just outside the forms, depositing concrete ahead of a Jaeger spreader equipped with Jackson side vibrators. A Jaeger-Lakewood finisher, with a vibrating screed powered by a Jackson generator, applied the transverse finish. A Koehring longitudinal float followed. Protex white-pigmented curing compound was applied by a Heltzel Flex-Plane curing spray. Water from the Fargo municipal supply was hauled to the paver in two 2,500-gallon tank trailers with Autocar and International truck-tractors.

All contraction joints were made by Clipper concrete saws, 25-hp self-propelled machines using double diamond-edged blades. The 10 and 12-inch blades were mounted side by side on the same shaft, and the result was a cut ¼ inch wide from the surface to the depth reached by the 10-inch blade. The 12-inch blade penetrated another inch, making a cut about ⅛ inch wide. This wide cut made by both blades proved much easier to clean and fill than the conventional single-blade cut.

The new model Clipper joint sealer heated and applied sealing materials. This self-contained trailer-mounted machine was equipped with a Wisconsin engine which operated the constant agitator in the heating kettle and pumped the material to the applicator nozzle. Liquefied petroleum gas, carried in containers mounted on the rear of the rig, provided heat. Workmen first cleaned the joints with an air blast from a Le Roi Tractair which towed the joint sealing rig. Servicised jet-fuel-resistant filler was applied to the joints in the apron and joints near the ends of the runway. Other joints were filled with Kapco rubber-asphalt compound.

Concrete batch plant

Five miles from the airport, Northern Improvement Co. had an established batch plant which was used for this project. Located on a siding in Fargo, about five miles from the paving site, this plant had been used more than seven years for paving jobs in and around the city. Aggregates received by rail from Detroit Lakes, Minn., were unloaded, stockpiled, and charged into the bins by Koehring 301 and 401 cranes. Two sizes of coarse aggregate were batched from a Johnson two-compartment 100-ton bin, and sand was handled in a Johnson 40-ton bin.

Universal Atlas cement from the mill at Duluth, Minn., arrived at the plant by rail and was handled in a Blaw-Knox 400-barrel cement plant equipped with a twin-batch weigh hopper and automatic recorders. Two 37.4-cubic-foot batches were weighed out into hired trucks and the contractor's 11 Fords and Chevrolets to keep the paver supplied.

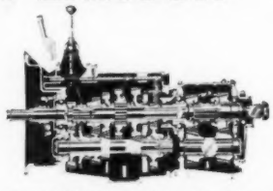
Roadways and sidewalks in the building area were also built by the paving contractor under a subcontract from Roel Construction Co., Inc. With few exceptions, the equipment which paved the taxiway was used for this work. Some of the smaller

Big loads, faster, speed new dam for Southern California Edison

Here is one of a fleet of Kenworth 801 earth movers, used by Southern California Edison to excavate and fill at their recently-completed dam in the Vermillion Valley of Central California.

Each of the Kenworths is powered by a 200 hp diesel driving through a Fuller 10-F-1220 Transmission—hauling a rated payload capacity of 36,000 lbs. This 10-speed heavy-duty transmission has even, short steps (average 30%) between ratios that help maintain rpm at the most efficient, highest economy range.

On job after job, where loads are the biggest and the going is the toughest, you'll find Fuller Transmissions putting horsepower to work efficiently. Next time you order heavy-duty construction equipment, specify Fuller Transmissions.



Model 10-F-1220, Fuller heavy-duty Transmission designed for use with engines up to 1220 cu. in. displacement.

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Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

pours were made with a Koehring 16-E Twinbatch paver mounted on rubber tires. Where it was not economical to use the larger finishing machines, the concrete was screeded with a Jackson electric-powered vibrating screed and finished by hand.

Building maintenance hangar

The maintenance hangar, a major building in the project, is 210 feet square and has 144×210 feet of unobstructed floor space spanned by steel roof trusses. Spread concrete footings support the structural steel superstructure. Exterior walls are of brick and corrugated asbestos. When the column footings and exterior concrete walls had been brought up to grade, topsoil and vegetation were stripped from the site by a Hough Payloader and hauled to waste areas. The subgrade was then compacted to a modified Proctor density of 95 per cent with a Bros Wobble Wheel roller pulled by a John Deere tractor. Workmen secured compaction around the footings and near the walls with pneumatic tampers powered by a Worthington compressor.

In the central area of the hangar, a base of 11 inches of filter gravel was placed and compacted to 100 per cent density. Around the edges, where heavy wheel loads will not be applied, a 6-inch base course was laid. The same methods and equipment used on the subgrade were used to compact the base. Concrete floors, 11 inches thick over the 11-inch base and 6 inches thick over the 6-inch base, were poured after the building was closed in.

The crash-truck station is a masonry and steel structure 50 feet square. The paint, oil, and dope-storage building measures 20×15 feet and is constructed of brick and tile. Construction of underground utilities serving these buildings, finish grading, seeding and sodding, and work on the concrete roads and sidewalks were subcontracted.

Personnel

Supervising the construction activities for Northern Improvement Co. was John L. McCormick, Jr., secretary-treasurer of the firm. John P. Beck supervised the earthmoving operations for William Collins & Sons, Inc. Project manager for Roel Construction Co. was Stewart V. Wright. He was assisted by William Burwald, superintendent. Henry C. Ranspot served as resident engineer for the U. S. Army Corps of Engineers. Col. T. J. Hayes, III, is district engineer of the Omaha district. THE END

Color in building design

The use of color in plants, office buildings, hospitals, hotels, and other buildings is discussed in a new volume, "New Horizons in Color", by Faber Birren. Physical, aesthetic, psychological, and functional aspects of color are treated, and the book is profusely illustrated with both color and black-and-white plates. Priced at $10, the book may be ordered from Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y.

THIS INDIAN 5-gallon drinking-water and supply tank is made of galvanized Armco zinc grip steel. A ventilated form-fitting shield keeps water cool and makes the tank easy to carry. The tank can be used to carry drinking water or hot coffee, and also gasoline, kerosene, or fuel oil. For further information write to D. B. Smith & Co., Inc., Smith Bldg., Main St., Utica 2, N. Y., or use the Request Card that is bound in at page 18. Circle No. 219.

Bucyrus-Erie 38-B shovel excavated one-third of total yardage on this job with rock and conglomerate predominant material.

CALIFORNIA CONTRACTOR PASSES TOUGH TEST ON FIRST BIG JOB

When this Southern California contracting firm was awarded the contract for rebuilding 8.16 miles of secondary highway in east-central California, work plans had to be made carefully. A few of the reasons: the job was in a remote location between Bridgeport and the Nevada line, 8000 feet up in the Sierras, and through plenty of tough granite rock.

Breakdowns were the principal worry, for this was the biggest job the firm had ever tackled. Two major decisions were made: (1) to use equipment known for dependability, and (2) to service each piece up to factory-approved standards.

A new 1½-yd. Bucyrus-Erie 38-B shovel took over the toughest excavating. Pre-bid estimates were based on 1,000 cubic yards of excavation per 8-hour shift for this machine. Weeks went by and the 38-B worked a full shift daily with no lost time, handled boulders up to 72 inches in diameter, and dug rock so well that blasting was negligible. Final yardage figures for the long-haul phase of the job showed the 38-B averaged up to 1,200 cubic yards per shift — 20% better than the pre-bid estimate.

This same 38-B, equipped with dragshovel front end, just completed another difficult job for its owner, I. L. Croft & Son, Inc. of Saugus, California. This one was the construction of an aqueduct for the City of San Diego and, once again, Bucyrus-Erie dependability and big-output performance helped the owner finish the job on time, and at a profit.

That same kind of performance is ready to go to work for you — in excavators from ⅜ to 4-yd. sizes. See your Bucyrus-Erie distributor soon for complete information. 99E55C

Here the new highway hugs the bank of the East Walker River, 6,000 ft. up in the Sierras.

BUCYRUS ERIE
South Milwaukee Wisconsin

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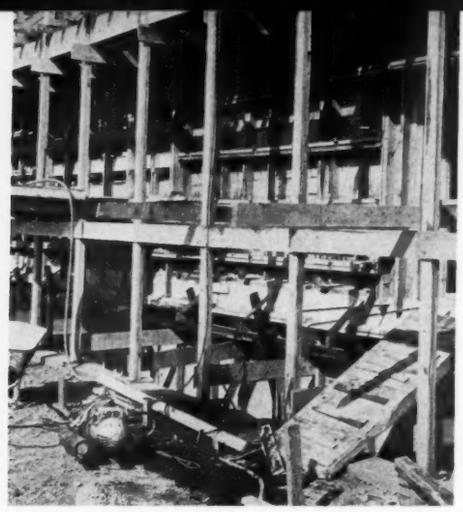
YEARS OF SERVICE to Men Who Shape the Earth



Form panels are set in place and tied, ready for a pour. A Homelite generator, working at ground level, powers Homelite vibrators used to consolidate the mix.
Ray Day Photos

Contractor demonstrates savings on small sewage-plant job

Solid sandstone rather than the usual problem of ground water presented the worst threat to economical operations on the new 3-mgd primary sewage-treatment plant near Gresham, Oreg. But Lee Hoffman, Beverton, Oreg., contractor on the $186,000 facility, started the job off with enough drilling and blasting equipment to put the work on an efficient and money-saving basis immediately.

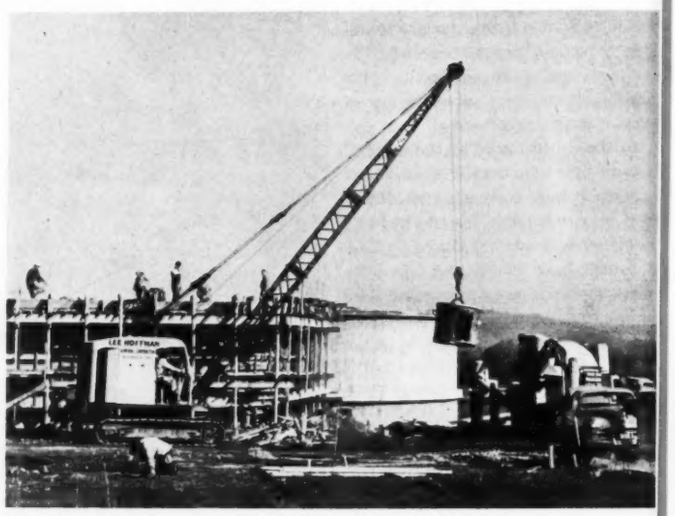
Making economical use of all equipment available, Hoffman may save the city of Gresham some money on the project. The plant, 4 miles outside the city limits, is being financed with a $750,000 bond issue covering the cost of the treatment facilities, four miles of sewer, and 4,500 feet of pressure line discharge pipe which runs under two dikes into the Columbia River. The bond issue also includes the cost of necessary engineering and inspection.

Two digesters, a control house, grit channel, comminutor and measuring flume, a clarifier, several sludge beds, mechanical equipment, and piping are included in the plant itself. The engineering firm of Stevens & Thompson, Portland, Oreg., designed the facility for ultimate enlargement to 12-mgd capacity. The new plant replaces the overloaded Gresham sewage-treatment installation which had created a pollution problem in the Johnson Creek discharge area.

Equipping his crews with Gardner-Denver 500-cfm air compressors and wagon drills, Hoffman used tungsten-carbide bits to rip into the rock. Atlas powder charges, using Atlas electric blasting caps, shattered the sandstone. A Bucyrus-Erie 22-B—used as both a dragline and backdigger during the various phases of construction—scooped away the sandstone for the foundation.

Versatile form work

Though the concrete portion of the job was small, Hoffman slashed forming costs by designing conventional wood forms which could be re-used up to four times. Two-foot prefabri-



Swinging a Gar-Bro 1-yard bucket from the Rex truck mixer, a Bucyrus-Erie crane places concrete for one of the slabs tying the digesters together.

LOW BIDDER?

Insure your profit . . .

USE TRIPLEX
BACKFILL TAMPERS
Standard and Super Models

Why "TRIPLEX"?

. . . Because you get:

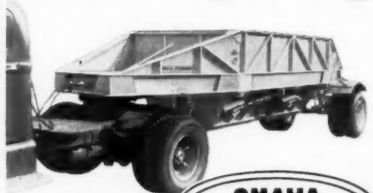
1. Highest compaction production to any desired density on all soils, including free-draining soils.
2. Lowest original and lowest maintenance cost.
3. One man plus one "TRIPLEX" production equals production of 5 men plus 5 single tampers plus more air.
4. Exclusive Air Filter, assuring continuous, trouble-free operation.
5. Horizontally swinging swivel air intake connection for ease of handling.
6. Air manifolded for correct distribution to all three tampers.
7. Choice of all makes of tampers.

GUNDERSON-TAYLOR MACHINERY COMPANY

1237 Shoshone Street • Denver 4, Colorado

GUNDERSON-TAYLOR MACHINERY CO. CE 7-55
1237 Shoshone Street
Denver 4, Colo.
Please send "Compaction Handbook" and all information about "TRIPLEX" Backfill Tamper.
Name.....
Title.....
Street.....
City.....
State.....
Firm.....
Street.....
City.....
State.....

Haul Larger Legal Payloads



FASTER . . .
EASIER . . .
CHEAPER . . .

With an OMAHA STANDARD CENTER DUMP TRAILER!

Lower initial cost—less maintenance—faster unloading time—increased payloads. Put an Omaha Standard Center Dump Trailer on the job, and let gravity do the work.

Throughout the United States and Canada, hundreds of contractors are using Omaha Standard Center Dump Trailers for hauling, dumping, spreading and stockpiling all types of flowing materials; — dirt, gravel, shale, rock, sand, chemicals, cement, etc. And they find that it quickly pays for itself.

The Omaha Standard Center Dump Trailer is designed and built to give you greater production at less cost — conforms with all state bridge and axle laws. Illustration shows 10-yd. trailer. Built in all yardages, for any material, single or tandem, for on or off highway. Also available with cross-flow hoppers for spreading. Tell us your problem. Write now for full information.

OMAHA STANDARD
FACTORY AND GENERAL OFFICES
2401 W. Broadway
COUNCIL BLUFFS, IOWA

A Gar-Bro buggy places concrete for a deck slab at the sewage-treatment plant while a Homelite high-cycle vibrator consolidates the material.

cated form sections built by Concrete Forms, Inc., were used to construct the first 8-foot section of the clarifier walls. These panels were straight, but Hoffman used them successfully to form a curved surface by driving small wood wedges into the back openings. Symons form clamps, passing through single 1×6 wales, held the forms in place.

Forms for the two identical digesters were constructed of ¾-inch fir shiplap lumber, permitting both digesters to be completed in four pours. After the first half of digester No. 1 was poured, the forms were moved so that the first half of digester No. 2 could be placed. The forms were then raised to complete the second half of digester No. 2. In the final operation, the forms were moved to digester No. 1 to complete the second half of the unit. Forming was built on the job, where the shiplap was nailed to bandsawed ribs cut to the exact curvature of the tank. Twistye clamps, standard Twistyes, and vertical wales held the forms in place.

All pours—even the smallest—were completely mechanized for the sake of economy. Concrete from Ross Island Sand & Gravel Co., Portland, was supplied to the site by Rex truck mixers. These dumped directly from their chutes for low-level pours. Where direct dumping was not possible, Gar-Bro hand buggies wheeled the material to the pours.

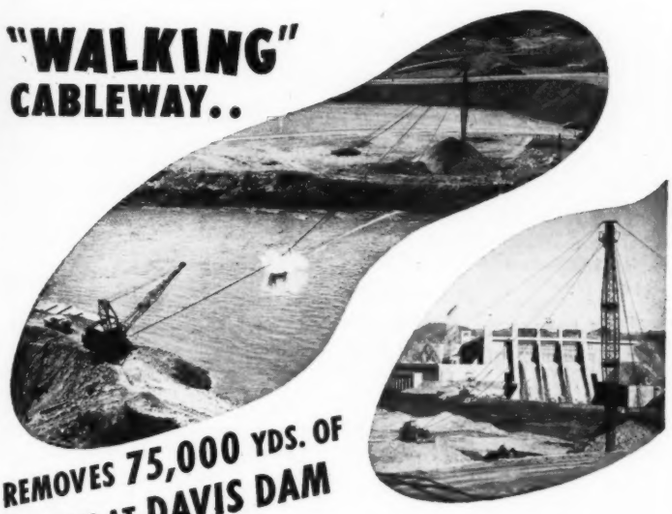
A Bucyrus-Erie 22-B, equipped with Gar-Bro 1-yard bucket, hoisted concrete from the truck mixers to higher pours, such as those on walls and roof. The bucket was always dumped vertically, and the concrete was placed in small increments as close as possible to its final location.

Job superintendent W. K. Lathrop had 5-foot timber sections prefabricated for use as runways so that buggies could bring concrete to pours out of reach of the crane. These runways could be quickly put down when needed and were just as easily removed. When the roof pour over the control building was being made, buggies brought the concrete to the far edge of the slab. But as soon as the crane could reach the innermost part of the slab, buggies were taken off the job and the walkways removed.

Concrete specifications called for the low-slump high-strength mix to be vibrated enough to make the walls and floors watertight. Needed vibration was supplied by Homelite high-cycle 220 vibrators, driven by Homelite portable gasoline-engine-driven units.

The entire construction schedule was timed so that plant equipment could be installed as soon as it arrived at the site. A few days before the clarifier sweeper machinery arrived, concrete work on the clarifier was completely finished. And the digesters and pump room were completed and ready when pumps and similar equipment arrived at the plant. THE END

"WALKING" CABLEWAY..



REMOVES 75,000 YDS. OF ROCK AT DAVIS DAM

To deepen the Colorado River from Davis Dam to 2,000 ft. downstream, Grafe-Callahan Construction Co. employed a Sauerman Slackline Cableway in this unusual arrangement:

Mast and hoist of the 2-cu. yd. machine were mounted on wooden mats. Only four "steps" were required in covering the 2,000-ft. distance as the excavation progressed. Maximum span was 600 ft. A crawler crane, running on a 30-ft. cofferdam on the opposite bank, served as tail anchor.

Total excavation was 75,000 yds. of rock. Excavation depth ranged from 10 to 15 ft. to provide the 20-ft. channel depth to lower tailwater at the power plant for maximum effective head on turbines.

Sauerman Slackline Cableways—1/3 to 3-1/2 cu. yds. in size—span water, bogs or pits to distances up to 1,000 ft. On the ordinary or the unusual job, this Sauerman equipment is unexcelled for deep digging or handling rock, sand, clay, peat and ore.

Experienced Sauerman Engineers can solve your excavating problems. Write today. Request Catalog C, "Slackline Cableways", and also pertinent field reports.

SAUERMAN BROS. INC.
616 S. 28th AVE., BELLWOOD, ILL.

JETCO JIFFY® HEAVY DUTY EQUIPMENT

FOR ALL TYPES OF TRENCHERS

HEAVY DUTY WHEELS

Fabricated of high alloy steel for long wear.
Standard ¾", ⅞", or 1" thicknesses, or to specification.
Standard or specified diameters.
Holes pre-drilled for bucket installation.
Shipped ready for installation.

Photo of Cleveland 320 heavy duty wheel, buckets and teeth.

HEAVY DUTY BUCKETS

Fabricated from high quality steel in ⅝", ¾" and ⅞" thicknesses. • No further welding or hole drilling necessary. • Jetco weld-on pockets give added strength to bucket. • Pre-drilled holes for side-cutters included.

Shipped ready for installation.

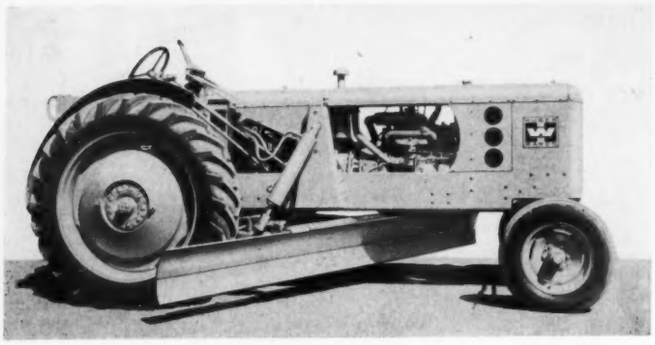
HEAVY DUTY TEETH & POCKETS

Drop-forged, weld-on pocket with smooth radius for positive taper fit with Jetco Jiffy Teeth—no bolts. • Self-sharpening, quick change, reversible teeth of high quality steel for longer wear. • Teeth designed for all types of soils. • Minimum leading edge leverage.

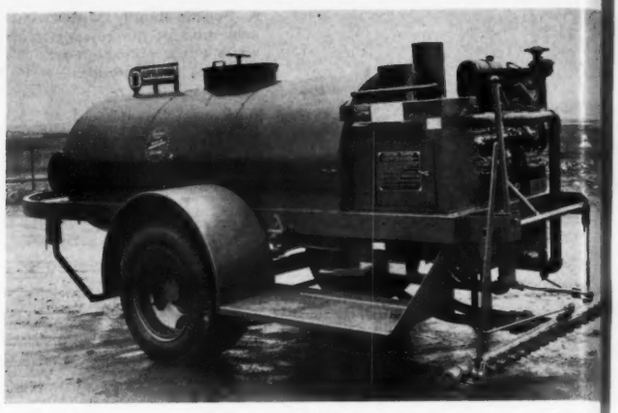
Write for catalog

JETCO, INC.
Dept. C, 1100 Westminster Avenue
Alhambra, California

New improved maintainer equipped with torque converter and power moldboard



The new Huber-Warco maintainer.



The new Littleford Model 101 utility asphalt sprayer with improved spraybar. ►

■ A maintainer featuring a torque-converter and a power-sliding moldboard as standard equipment is announced by Huber-Warco Co., Marion, Ohio. The new unit is an improved version of the maintainer formerly built by Huber Mfg. Co., now a part of the recently formed Huber-Warco.

Among advanced features is a hydraulic torque converter that automatically balances the torque of the engine to the load demand of the maintainer. At the same time the hydraulic drive protects the machine from shock loads, thus increasing its service life.

The use of a power-sliding moldboard adds to the working capacity of the new model. This means the unit will not deviate from the line of travel as an operator approaches culverts, abutments, or posts.

The machine is available with either a Continental F-162 gasoline engine with 45½ horsepower, or a Continental GD-157 diesel engine with 40 horsepower. Five speeds range from 1.7 to 21 mph.

A thousand pounds heavier than its predecessor, the new unit weighs 7,200 pounds with calcium chloride solution in the rear tires. Its wheelbase is 9 feet 6 inches.

Many of the new features are designed to increase ease of operation and working efficiency. Automotive-type hand steering requires one third as much effort as before. The gear shift is now located on the steering column, and the clutch is foot-operated. A hydraulic-cushioned seat provides more comfort for the operator by absorbing shocks.

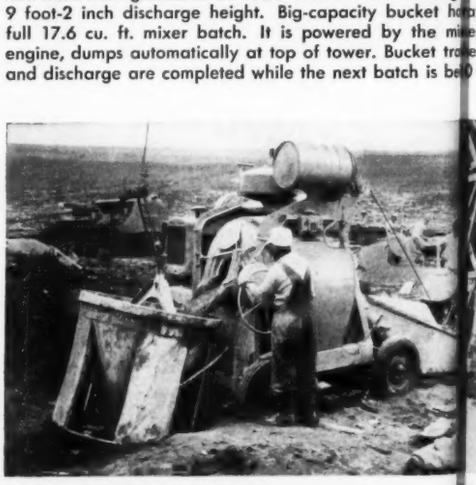
The hydraulic system has been completely redesigned and improved. A new six-unit control valve has been relocated for greater operator convenience. The hydraulic pump is now gear-driven from the engine, and the hydraulic system capacity has been increased to 10 gallons.

With its hydraulically controlled attachments, the Huber-Warco maintainer serves as a bullodzer, lift-loader, side dozer, berm leveler, broom, patch roller, mower, or snowplow. Among improvements is a redesigned cab with a removable top.

For further information write to the company, or use the Request Card at page 18. Circle No. 249.

LOADS TRUCKS — Producing concrete for curbs mixed. T gutters, a Kwik-Mix 16-S Dandie mixer dumps batch dire uction. into truck from ground level. Tower loader attachment g ction is 9 foot-2 inch discharge height. Big-capacity bucket h vel cle full 17.6 cu. ft. mixer batch. It is powered by the mi ent is al engine, dumps automatically at top of tower. Bucket tr e concr and discharge are completed while the next batch is be and

SETS UP AS CENTRAL-MIX PLANT — on bridge construction, two Kwik-Mix 16-S Dandie concrete mixers, with wheels removed, were set up side-by-side as permanent mix plants. Both were equipped with tower attachment for truck-loading operation. These big-capacity mixers also can be set up as stationary plants on elevated platforms by adding an extension track to charge the drum.



LOADS CONCRETE BUCKETS — Working on a AMS U highway relocation project, this mobile 16-S Dandie mi ete for concrete for a series of box culverts — discharged b s produ into concrete bucket. To suit operating conditions, x 16-S versatile Kwik-Mix 16-S mixer is adaptable to side or tcher — discharge. Axles are readily interchangeable on the sq m. (Oth mixer frame. Change-over is easy, takes less than an h de: 11-

KWIK-MIX COMPANY, Milwaukee 16, Wis. (Koeh Subsi

New asphalt spray tank has improved spraybar

(Illustration on facing page)

■ A new spray tank for spraying asphalt, tar, emulsions, cutback, or road oils has been announced by Littleford Bros., Inc., 457 E. Pearl St., Cincinnati 2, Ohio. The Model 101 utility spray tank now features an improved mechanical-type circulating spraybar with positive-acting nozzles.

Equipment for the new model includes a full-circulating spraybar available in widths up to 12 feet for small jobs. A hand spray attachment is included for patch work, and a pouring-pot outlet is useful for crack filling and patch work.

The new sprayer can be furnished in either the shifting or nonshifting type. The shifting type also includes a raising and lowering feature. It is possible to spray with either half of the new bar or with any desired length.

The Model 101 sprayer has two Littleford torch-type burners, a heat chamber for pump and valves, 16×22-inch manhole, 8-hp engine, and 100-gallon pump. Mounted on a two-wheel trailer, the new sprayer is available with 400 and 600-gallon tanks. Sizes up to 1,250 gallons are offered on four-wheel trailers, and a truck-mounted model carries a tank up to 1,000 gallons in size.

For further information write to the company, or use the Request Card at page 18. Circle No. 302.

A heavier version of the Ateco rock ripper is now available for the new Series D and E Caterpillar tractors.

Heavier rock ripper for new crawler tractors

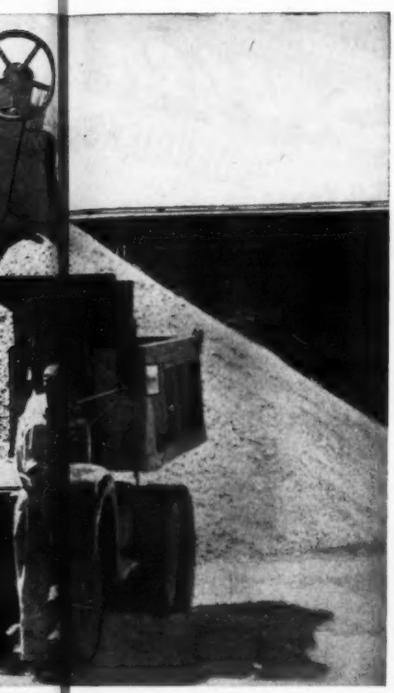
■ A new heavy-duty Ateco rock ripper, designed to take advantage of the increased power of the new Series D and E Caterpillar D8 tractors, has been announced by American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif. The new unit is a heavier version of the Ateco ripper for standard D8 tractors that have been on the market for the past two years.

Improvements include a stronger beam, thicker ripper shanks, heavier drawbar plate, and renewable wear pads on the swinging brackets. The ripper's hydraulic control system includes a new pump, said to be 25 per cent more efficient, to run cooler, and to require less power.

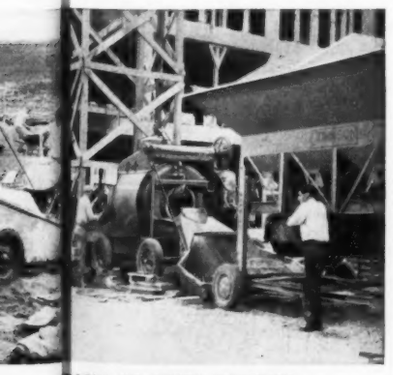
As in the earlier model, the ripper shanks are especially curved to aid penetration and to produce an underground "quivering" action which shatters rock and other hard materials for easy scraper loading. Shanks, equipped with heavy rock-splitting boots and points, have two adjustments: one for 18-inch penetration, the other for 24-inch depths. Cutting depths to 30 inches are available on request.

The head frame is designed to accommodate special tools, including subsoiler shanks capable of penetration up to 48 inches. Shanks attach to the beam by swinging brackets, permitting them to follow the tractor like a trailer for effortless steering. The mounting arrangement puts the pull on the drawbar rather than on the tractor case, thus eliminating possibility of damage to the tractor.

For further information write to the company, or use the Request Card at page 18. Circle No. 307.



curbs mixed. There's no delay to mixer pro-tch direction. Tower is easily attached. Top nment gjection is hinged, folds back for ample ucket hoavel clearance. Tower loader attach- the mixent is also available on the 11-S Dan-ucket tra concrete mixer, and on Kwik-Mix ch is be and 14 cu. ft. bituminous mixers.



on a s**EAMS UP WITH BATCHER** — Con-andie mixete for a new apartment building arged bas produced on the job by this Kwik-ditions, ix 16-S mixer and Johnson Lo-Bin side or tcher — a low-cost, big-production the sqeam. (Other sizes in Kwik-Mix line in-an an hode: 11-S, 6-S, 3½-S Dandie mixers.)

(Koeh so: Plaster-mortar mixers, Subsi uminous mixers, Moto-Bugs.®

Johnson ⅜ to 3-yard Clamshell Buckets

Smooth inside and out, Johnson all-welded clamshells dig and dump with less resistance . . . give fast clean discharge. They're quick-filling, easy-closing, because big needle bearing-mounted sheaves reduce friction loss, deliver full digging power to cutting edge. Hard manganese edge, welded to heavy lips, toughens with use. 3 types, 10 sizes: ⅜ to 3 yds. Also check Johnson line of concrete plants, bins, batchers, hoppers, silos.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)

215 Trenchliner® digs 18 feet per min.

With 30 digging feeds, this cross-country 215 Trenchliner digs 6 in. to 18 feet per min., 13 to 31 in. wide, up to 6 ft. deep. Square or round-bottom buckets have "easy-in, easy-out" Tap-In teeth. Standard tractor-type crawlers have 18-in. treads, lug-type shoes. Other Parsons Trenchliners: wheel-type 202 for drainage and utility work; 3 ladder-types, full crawler mounted; and the mobile, utility size rubber-tired Trenchmobile®.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

Koehring ½-Yd. 205 has 10 or 15-ton lift

On clamshell, dragline, or lift crane operation, you gain an important advantage in extra load capacity with Koehring heavy-duty 205. On crawler mounting, it has 10-ton lift capacity, and boom lengths of 30 to 50 feet. As a rubber-tired truck crane, it safely lifts up to 15 tons. Maximum boom length is 55 ft. Quickly converts to ½-yard shovel or hoe. Three other Koehring sizes up to 2½ yards . . . crane lift capacities up to 79½ tons.

KOEHRING Company
Milwaukee 16, Wisconsin

264

Warner & Swasey division makes four promotions

Four branch-office personnel changes have been made by the Gradall Division of The Warner & Swasey Co., Cleveland, Ohio.

W. C. Worthington, former field engineer in the Atlanta office, has been promoted to the post of district manager of the Philadelphia territory and will work from the Philadelphia office. The former service representative for the Atlanta territory, Russell Dessecker, has been made field engineer for the territory. He will cover the territory with Richard Bair, who has just been promoted to field engineer.

S. O. Adams, a former service representative for the Houston territory, has been made field engineer.

This mobile laboratory developed by Soiltest, Inc., makes it possible to take soil samples at the work site and to subject them immediately to thorough tests.

Mobile laboratory tests soils on the job site

■ A large variety of equipment and apparatus for soil testing on the job site is available from Soiltest, Inc., 4522 W. North Ave., Chicago 39, Ill. Drilling rigs, compression and shear machines, electric soil mixers and warmers, and soil-compaction apparatus are among the many instruments this concern produces.

The heart of soil-testing operations in the field is a portable core drill for taking soil borings. This drill is mounted on a truck with other testing equipment.

Samples are logged for depth, type, and penetration-resistance qualities. They are then subjected to laboratory procedures, in which they are tested for strength, moisture content, density, and similar physical properties. From such data, engineers can tell how much load the soil will take and contractors can determine excavation requirements.

Portable power for the testing operations of the mobile laboratories is supplied by a Kohler 3½-kw electric plant. The 3,500 watts the plant develops supply electric power to operate ovens, hot plates, mixers, concrete-testing machines, sieve shakers and moisture-control equipment, etc.

For further information write to the company, or use the Request Card at page 18. Circle No. 334.

Merger of Hercules Steel, Central Ohio Steel planned

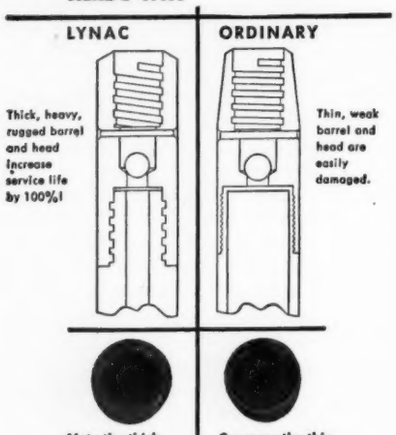
Plans for the merger of Hercules Steel Products Corp. and Central Ohio Steel Products Co., both of Galion, Ohio, have been placed before stockholders of both companies for their approval. Both firms manufacture dump bodies and hoists.

Upon the approval of the merger, Central Ohio stockholders will receive two shares of common stock of the merged company for each of their present shares. Hercules stockholders will retain their present shares. Operations are to be consolidated, but no changes will be made in the present distribution methods of distributor setups. All current product lines will keep their present trade names.

new acker Lynac* split tube sampler

increases service life 100%

HERE'S WHY


LYNAC
ORDINARY
Thick, heavy, rugged barrel and head increase service life by 100%!
Thin, weak barrel and head are easily damaged.
Note the thick shoulder of the LYNAC Head.
Compare the thin, easily cracked shoulder of the standard head.

Acker engineers have done it again! By improving the design and construction of the standard split tube samplers, Acker engineers increased the service life of their new LYNAC Sampler by over 100%!

Look over the drawings at the left and you'll see why. Then, write for literature describing Acker's new LYNAC Sampler.

ASK FOR COMPLETE CATALOG ON SOIL SAMPLING

ACKER DRILL CO., Inc.
SCRANTON 3, PA., U.S.A.

*Patent applied for

Sasgen DERRICKS

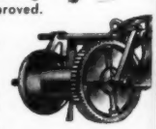
50 Years EXPERIENCE AS MANUFACTURERS OF CONTRACTORS'... HOISTS WINCHES

- Easily rigged on the job
- Conservatively rated for safety
- Simple in design, low on maintenance

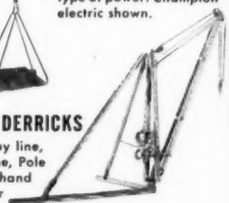
LIFTAMATIC—new, low cost answer to hoisting problems. Features automatic stops, remote control and positive safety device as standard equipment. 1200 lb. live load capacity... lifts to 110 ft. Uses gas or electric power, which can also serve other hoists.

SAFETY SCAFFOLD WINCH
Swing stage type. Safest for suspended scaffolding. UL Approved.

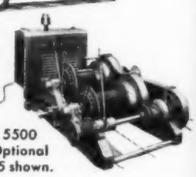
HAND-POWERED WINCHES
Safe worm or spur gear design. Sizes for 400 to 40,000 lb. load. No. 110 shown.



ROOFERS' CIRCLE SWING DERRICKS
360° operation. 500 to 2500 lb. capacities. Optional type of power. Champion electric shown.



STIFF LEG DERRICKS
All types—guy line, setter, A-frame, Pole and Tripod—hand and/or power operated.



CONTRACTOR'S HOISTS
Single or double drum types with capacities from 500 to 5500 lb. single line pull. Optional type of power. DD55 shown.

Known the world over, the Sasgen line is handled by leading equipment distributors everywhere. See your dealer today...or write direct for latest Catalog. No obligation.

SASGEN DERRICK COMPANY
3127 West Grand Avenue, Chicago 22, Illinois

THIS CRANE IS CUTTING COSTS!

Earth moving power units, truck tires and welding equipment are easily moved with the Hiab.

Whenever heavy equipment or materials must be moved, the Hiab is the most versatile cost cutting tool on the job. It dumps truck body. With clam shell or drag scoop, it cleans ditches, covers pipelines, excavates and levels. Quickly mounted on truck or stationary platform.

VERSATILE HIAB CRANES LIFT & SWING HYDRAULICALLY

Truck engine supplies power through a single speed power take-off unit which drives hydraulic pump through connecting driveshaft and universal joints.

Control lever operates from either side. It can be set in any position and left unattended.

Telescopic boom swings full 360°. Lifting capacity 2200 lbs.

Note how boom extends nearly 20 feet above ground to unload this 2200 lb. transfer.

DEALERS

These dealers invite you to test the HIAB crane on-the-job. No obligation. C. H. Grant, Oakland, California; Nelson Equipment Co., Portland, Ore.; Tatom Equipment Co., Seattle, Wash.; Rocky Mt. Machinery, Salt Lake City, Utah; C. & H. Equipment Co., San Francisco; Western Traction Co., Sacramento; J. E. Morton Equipment Co., Abilene, Texas; Craig Taylor Equipment Co., Anchorage, Alaska.

Dealerships open in certain areas. Write for complete information.

Stanco MFGS & SALES INC
1931 Pontius St.
Los Angeles 25, Calif.

The Brushmaster sprayer, consisting of a skid-mounted 100-gallon tank, valves, gasoline engine, is recommended for spraying weeds along roadsides.

Truck-mounted equipment for roadside spraying

■ New skid-mounted weed-spraying equipment that can be carried on a half-ton truck has been placed on the market by Farmrite Sprayer, Inc., Clyman, Wis. The portable equipment is suitable for spraying brush, small trees, and weeds along roadsides.

Compression power for the unit comes from a Kohler Model K160 6.6-hp engine, which has a high ratio of output to weight. The sprayer is equipped with a 100-gallon tank.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 338.

Vibrating mechanism for small screens

■ The availability of its Unitized Lifetime vibrating mechanism on smaller vibrating screens is announced by Deister Machine Co., Fort Wayne, Ind. While up to now this feature has been available only for 4×8-foot and larger vibrating screens, it can now be specified for 3×6-foot to 6×14-foot screens.

The Deister Unitized Lifetime vibrating mechanism is reported to offer long service life. Renewable sleeves between the outer race of the spherical roller bearings and the bearing housings prevent any wear on the housings themselves. Shaft wear is also prevented by renewable sleeves between the shaft and the inner race. After years of service, the original close tolerances can be easily restored by the simple replacement of renewable sleeves and bearings.

The vibrating mechanism itself is demountable and readily interchanged as a unit. A large-diameter spacer tube maintains proper factory alignments of the entire assembly.

For further information write to the company, or use the Request Card at page 18. Circle No. 209.

Batch-mix asphalt plant has improved design

■ The improvements found in the new Hetherington & Berner Type T batch-mix asphalt plant are covered in a new booklet available on request. The Type T plant is available in four sizes ranging from 60 to 180 tons per hour in capacity.

New features include changes in structural design, a new type of Diester flat screen, self-contained overflows, self-contained dust bin, choice of power, individual trunnion roll drive on the dryer, air controls, and factory-installed wiring.

A cutaway drawing illustrates the operation of the complete batch plant. In addition, each component is illustrated and discussed individually.

To obtain Bulletin T-55 write to Hetherington & Berner, Inc., 701-745 Kentucky Ave., Indianapolis 7, Ind., or use the Request Card at page 18. Circle No. 309.

Chain Belt appoints two

The appointments of Richard M. Leek as assistant sales manager and of Ken Klabunde as mid-Atlantic district manager have been announced by the construction machinery division of Chain Belt Co., Milwaukee, Wis.

Mr. Leek has served Chain Belt in various capacities since 1949. Mr. Klabunde has been with the company since 1950.

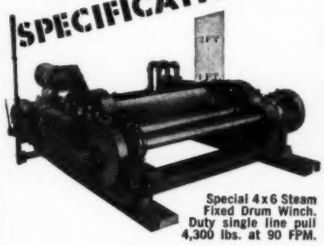
TAMPO'S SELF-PROPELLED

outsells all other makes combined!

NEW for '55
NEW improved hydraulic steering system
NEW muffler and exhaust extension with rain cap
NEW stronger drive wheels
NEW improved heavy duty drive axles
NEW Triple-Seal wheel grease seal
NEW increased horse power

TAMPO MANUFACTURING CO.
1146 W. Laurel St., San Antonio, Texas

You SET THE SPECIFICATIONS...



Special 4x6 Steam Fixed Drum Winch. Duty single line pull 4,300 lbs. at 90 FPM.

Superior-Lidgerwood-Mundy has the facilities and experience to meet them . . . either from an all-inclusive line of standard hoisting equipment or with equipment engineered to your specific requirements.

WRITE FOR BULLETINS AND CATALOGS

SUPERIOR LIDGERWOOD MUNDY CORPORATION

Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Day Street, New York 7, N. Y.

Actual picture of 1½" slump concrete coming out at BETTER THAN A YARD EVERY 15 SECONDS! Only with CMC's exclusive Swing-Out Hopper is this possible.

CMC Transcretes make and deliver better concrete faster . . .

No wonder the "big swing" is to Transcretes. They're rugged, yet lighter in weight for more payload on the road, more concrete in the forms. New chute arrangement gives complete flexibility for any kind of pour. Transcrete's exclusive floating drive eliminates troubles experienced with ordinary rigid drives and has the simplest chain take-up ever.

3½ to 6 Yard Capacities

Write for New Bulletin
TM 1055

CONSTRUCTION MACHINERY COMPANY
Waterloo, Iowa

DISTRIBUTOR DOINGS

Caterpillar holds exposition for its distributor organization

H. S. Eberhard, president: "a year of unusual importance. . ."

Gail E. Spain, vice president: "We are on display. . ."

More than 500 distributors, field representatives, and auxiliary equipment manufacturers saw The Caterpillar Exposition last month at the Peoria, Ill., home plant of the Caterpillar Tractor Co. Domestic dealers met June 6 to 10, and the export dealers assembled June 13 to 17 to observe an array of $2 million worth of earthmoving equipment in action. Many of the machines demonstrated on the 800-acre proving grounds were viewed for the first time.

At the two full-week gatherings, top Caterpillar officials discussed the company's progress and outlook both at home and abroad, and demonstrated the advanced manufacturing techniques and facilities being used by some 21,000 workers at the huge Peoria plant. According to W. K. "Hy" Cox, sales promotion manager and program chairman for the event, the exposition afforded the dealers an opportunity to meet and talk with Caterpillar employees, and to observe the skills, training, and workmanship behind the products they sell.

Dealers came from every state in the Union, every province in Canada, and from 63 nations of the free world for the series of conferences and demonstrations covering research, engineering, manufacturing, and sales. Twelve other manufacturing firms which build products often used with Caterpillar equipment also participated in the exposition.

One of the highlights of the schedule was a tour of building KK—one of the largest and most modern diesel-engine factories in the world—where engines are produced for tractors, motor graders, and industrial applications. It covers 21.2 acres, and con-

Safety-Beam Protection at "Million Yard Fill"

Pushing the recently completed West Virginia Turnpike through the rugged foothills of the Alleghenies has been called "the toughest road job east of the Rockies." Winding mountain streams, canyons and sharply pitched hills were hardly an ideal terrain for roadbuilding.

To build the new highway with grades generally less than 3 pct and with curves limited to a minimum radius of 1000 ft required tremendous excavating, grading and filling operations. More than 70 bridges were built to carry the 88-mile-long turnpike over the mountainous terrain.

Near Beckley, W. Va., is the "million yard fill," a good example of how the terrain was "rebuilt" to conform to the highway's specifications. Here, as at many other points on the West Virginia Turnpike, Bethlehem Safety-Beam Guard Rail was installed to help protect motorists. These sturdy sections of steel plate were bolted flush end-to-end to steel posts, making a continuous beam of impact-absorbing rail.

Bethlehem Safety-Beam Guard Rail is a strong and effective highway guard, with sufficient strength to withstand severe shocks from colliding vehicles, yet enough flexibility to redirect the vehicle parallel to the rail with minimum damage to both rail and vehicle.

Write to the nearest Bethlehem office for a copy of our new Safety-Beam Guard Rail catalog which gives full details and specifications.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

tains about 924,000 square feet of floor area. At the end of the engine assembly lines was an exhibit of 30 engines equipped in various ways to demonstrate the different markets where Caterpillar engines are used.

The big parade

At the sprawling proving grounds, operators put the yellow-painted earthmoving equipment through demonstrations ranging from excavating for foundations to building a highway or dam embankment. About 50 machines, working separately or in such combinations as tractor-scraper pairings, took part in the tests. Many of the units were equipped with one or more attachments made by either Caterpillar or one of its auxiliary manufacturers.

First came a string of six D2 tractors, smallest in the Caterpillar line, with 38 drawbar horsepower. One mounted a new 933 Traxcavator; one was equipped with an angle-type dozer; another towed a Martin equipment trailer. Next followed nine D4's, one with a new 955 Traxcavator. Both the 933 and the 955 Traxcavators will be introduced within the next couple of months. Equipment with these tractors included a No. 40 scraper, PD4 pipelayer, new hydraulically-controlled Hyster backhoe, and a Unimatic detachable ditcher.

Four tractors represented the D6 class. They were outfitted with an MD6 pipelayer, an Austin Overshot loader, a No. 60 scraper, and a Gurries plane for land leveling. A half-dozen D7 Cats then filed along, hooked up with a Rome offset harrow, a No. 70 scraper, a cable-controlled ripper, a Hyster ½-yard shovel with a 180-degree swing, Fleco rock rake and root cutter, and an MD7 pipelayer.

King-size earthmovers

Behind these came eight D8 work horses, showing how they operate with a new model U-dozer, a 27-yard No. 80 scraper, a Preco toothed dozer, push cups, ripper, Fleco tree cutter, Towner giant disk plow, the recently-introduced No. 583 pipelayer capable of handling any size pipe, and a new hydraulically-controlled tilting dozer blade.

Next a quartet of the new D9 Cats purred past the grandstand, displaying the much-talked-of turbochargers. These big crawlers worked with a straight dozer, angle dozer, push block, and with a No. 90 scraper in an exhibition of dirt moving.

In back of the tractors was a spread of motor graders—a No. 212, No. 112, and No. 12—a Domor elevating grader, and a new six-wheel-drive No. 12 model.

Bringing up the rear in the wheel-tractor class were the DW15, DW20, and DW21 with companion scrapers. Improved models of the last two units have just been introduced, with the DW21 being a 2-wheel tractor.

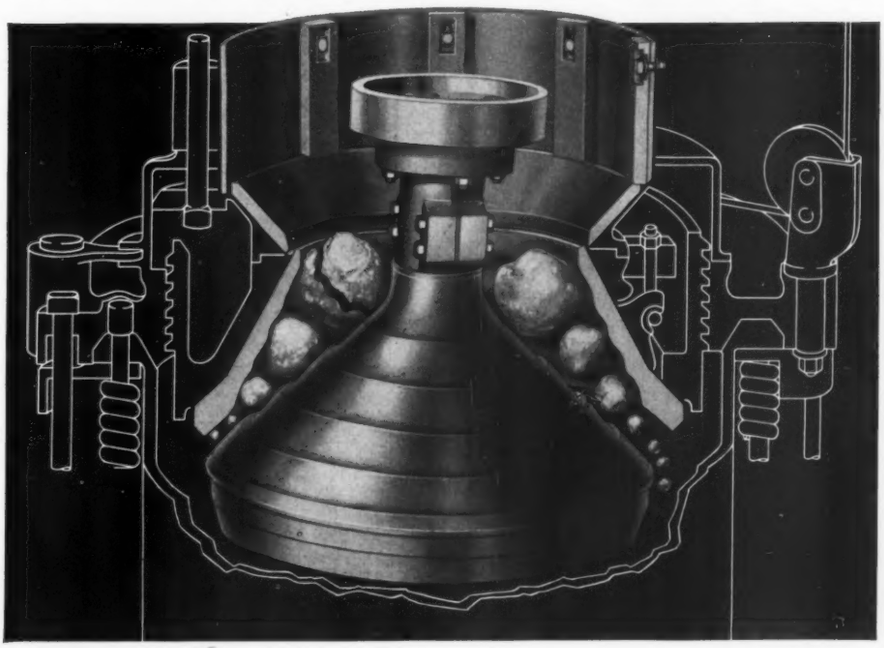
At the conferences

Speaking to the dealers, Caterpillar vice president Gail E. Spain reviewed the growth of the company since it was organized in 1925 from its predecessors—Holt Manufacturing Co. and

(Continued on next page)

Spectators at The Caterpillar Exposition for domestic and export dealers watch some of the $2 million worth of new and standard Caterpillar earthmoving equipment go through paces at the Peoria plant's 800-acre proving grounds.

AMSCO® CRUSHER PARTS "give" a little to TAKE MORE PUNISHMENT



Amsco crusher parts are made of the toughest steel known—manganese steel. Typical of the Amsco line are the mantle and bowl liner in this sketch of a Symons® Cone Crusher. Symons is a registered trademark of Nordberg Manufacturing Company.

Under the violent crushing forces of impact, abrasion and pressure, the surface of Amsco manganese steel crusher parts work-hardens to as high as 500 Brinell. Yet beneath the working surface, the metal remains strong and ductile . . . able to *give* slightly under crushing forces . . . developing hardness as a new working surface is exposed by wear. That's why manganese steel crusher parts last so long, enduring severe abuse and resisting cracking or chipping even when worn thin.

Amsco makes manganese steel crusher parts for most manufacturers of crushing, grinding and pulverizing equipment. Buy your replacement parts from your crusher manufacturer to be sure of getting Amsco manganese steel.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

THIS TRANSIT MAKES YOU MONEY!

AT LAST! — A professional transit at Builder's Level price — $205. Build, excavate, lay-out with confidence — farm, forest or construction. Brilliant optics, plunging telescope, bull-dog ruggedness, pays out on one job!

PROVE AT OUR RISK! If you don't agree 100%, return undamaged in 5 days at no cost. Budget terms.

Start It Earning For You Now! FREE Literature.

MIKRON INSTRUMENTS, INC., Dept. CE-75, 1966 E. Walnut St., Pasadena 8, Calif.

(Continued from preceding page)

C. L. Best Tractor Co. He told them that "there is still a great demand for rubber-tire units and for more horsepower. We believe the big demand for increased horsepower lies in the desire of contractors to reduce cycle time by seeking to raise the lower travel speeds. Peak speeds seem to have leveled off around the 20 to 25-mph zone, since it is not economically feasible to maintain roads for higher speeds than these."

He also disclosed that "field surveys indicate that contractors are taking a new look at the cost of blasting. There seems to be a trend towards ripping material loose and loading into scrapers. Incidentally, tractor-mounted rippers apparently are entering the picture, replacing the pull-type ripper".

After calling attention to the present day market trends and how they affected Caterpillar and its products, Spain emphasized that the exposition was no sales convention. "It is an opportunity," he declared, "for the equity owners of dealerships the world over to inspect their franchise. We are on display. They will see what is back of the Caterpillar account."

Eberhard speaks

Caterpillar's president, Harmon S. Eberhard, discussed the policies of the company today and trends for the future. He pointed out that at the end of World War II the company had two plants—at Peoria and San Leandro, Calif. Since then, an expansion program has increased Caterpillar facilities to nine plants, including foreign subsidiaries in England, Brazil, and Australia. By the end of this year the company will have spent $200 million on this expansion program, which also covers domestic plants at Joliet, Ill., Decatur, Ill., Milwaukee, Wis., and York, Pa.

The tractor tycoon pointed out that Caterpillar has no regular periods for introducing new features or new machines, and no yearly models. "1955 will be a year of unusual importance," he declared, "insofar as the introduction of new and improved Caterpillar machines is concerned. All these new machines are the outgrowth of a program of product development which we have been accelerating each year for many years, but which has been given its greatest impetus during the past year and a half. Never before in our history have we seen the results of so much engineering and research translated into such product realities as will be achieved this year."

The press, represented by 130 editors and publishers from more than 100 publications and newspapers, had a preview of the exposition on June 2.

THE END

Bucyrus-Erie distributors

R. J. Fyfe Equipment Ltd., Regina, Canada, is a new dealer for Bucyrus-Erie Co., South Milwaukee, Wis., in the province of Saskatchewan. The company has complete servicing facilities at its plant at 1148-50 Osler St., Regina, and a branch office is Saskatoon, Saskatchewan.

The Fyfe firm will offer sales and service on B-E cranes, excavators, walking draglines, the all-hydraulic Hydrocrane and Hydrohoe, Red Arch dragline buckets, blast hole drills, bit dressers, and other products in the Bucyrus-Erie line.

Sales and service on Bucyrus-Erie excavators and cranes in western Tennessee, northern Mississippi, and northeastern Arkansas are now being offered by Euclid-Memphis Sales, Inc., Memphis, Tenn. The distributor for the South Milwaukee, Wis., manufacturing firm has headquarters at 185 E. Butler Ave., Memphis.

Four dealers added by Wayne Shovel & Crane

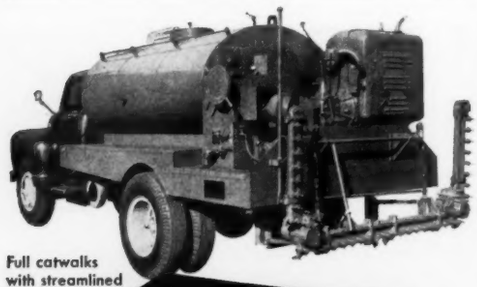
Four distributors for Wayne equipment have been appointed by the Wayne Shovel & Crane Division of the American Steel Dredge Co., Inc., Fort Wayne, Ind.

Two Southwestern dealers are Road Machinery Co., Phoenix, Ariz.; and McCall-Gardner Machinery Co., Houston, Texas. The former will cover the entire State of Arizona, and McCall-Gardner will concentrate sales efforts in eastern Texas. Vermont Road Equipment Co., Inc., Montpelier, will handle Wayne cranes and excavators in Vermont and part of New Hampshire, and Service Equipment Co., North Miami Beach, Fla., will have southern Florida as its sales territory.

Dealerships established by Marion-Osgood-General

A number of new dealers have been appointed to handle the combined lines of equipment made by Marion-Osgood-General, Marion, Ohio. In Ohio, Construction Machinery & Supply Co., Inc., 128 S. St. Clair St., Toledo and Weaver Truck, Trailer & Body Corp., 2405-15 N. Wooster Ave., Dover, will serve as distributors, while Calavar Corp., 2700 S. Broadway, Los Angeles, and Buran Equipment Co., 777 100th Ave., Oakland, will sell the equipment in California.

Other dealers located throughout the country are Talbert Construction Equipment Co., 7950 W. 47th St., Lyons, Ill.; Midwestern Engine & Equipment Co., Inc. 4645 Sapulpa



Full catwalks with streamlined skirting

State highway departments like

Abbreviated catwalk with tire flaps front and rear

the NEW LITTLEFORD
MODEL D SPRAY LEADER

the first low cost distributor you can buy with just the right amount of equipment for your requirements . . . no more, no less. And with the new Model D you get *your choice of 2 types of circulating spray bars:* automatic or mechanical. Most important, the Spray Leader has the *same operating system* used in the more expensive Littleford distributors. If you need a good, basic distributor at the lowest cost, the new Model D Spray Leader is your best buy. Send today for free descriptive bulletin 14-D.

LB LITTLEFORD
BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE - 1900
LITTLEFORD BROS., INC.
485 E. Pearl St., Cincinnati 2, Ohio

The First Reference Book to Cover Every Aspect of
Excavating and Earthmoving

MOVING THE EARTH
By Herbert L. Nichols, Jr. a contractor of 20 years experience who is a recognized authority in this field

- detailed descriptions of the operations an excavating contractor must perform on literally hundreds of different jobs
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ONLY 30-POUNDS CRANK EFFORT!
FULL CIRCLE ROTATION
AVAILABLE IN 2000# 1000# 500# CAPACITIES

WATSON Tools TRUCK MOUNTED
WA-99

WINCHES are handy TOO!

MODEL 1000-B
With 6-inch band brake & needle bearings.
1000# Capacity

CE-7
H. S. WATSON COMPANY
1316 - 67th St., Emeryville, California
Please send information on Watson Truck Tools and name of your nearest distributor.
☐ TRUCK CRANES ☐ POST HOLE DIGGER
☐ HAND WINCHES ☐ REAR POWER SOURCE
☐ UTILITY PUMP ☐ HELPER TRANSMISSIONS
Name
Address
City State

Road, Tulsa, Okla.; Western Machinery & Engine Co., 320 S. Grand Blvd., St. Louis, Mo.; and Central Supply & Equipment Co., Danville, Ky.

Also appointed were Martin Tractor Co., Inc., U. S. 75 S., Topeka, Kans.; James G. Hoag Co., 33rd and Arch Sts., Philadelphia, Pa.; R. B. Wing & Son Corp., 384-386 Broadway, Albany, N. Y.; Casey & Dupuis Equipment Corp.; 340 Pleasant St., Watertown, Mass.; J. C. Georg Construction Equipment Inc., 805 E. Genessee St., Syracuse, N. Y.; and Star Machinery Co., 241 Lander St., Seattle, Wash.

Oregon dealer for Clark

Sales and service on the line of axles, transmission, torque converters, and packaged power trains made by Clark Equipment Co., Buchanan, Mich., are being handled by a new dealer firm, Harlan C. McKay Co., 2950 S. W. Vista Drive, Portland, Oreg.

The McKay company will handle the Clark line in Idaho, Oregon, Washington, British Columbia, and Alaska. Harlan C. McKay, president of the firm, formerly was Northwest regional sales manager for the Buda division of Allis-Chalmers Manufacturing Co., and sales manager for the Cummins Diesel Sales, Inc., Seattle, Wash.

Huber-Warco adds firms to dealership roster

A number of dealers throughout the country have been appointed by Huber-Warco Co., Marion, Ohio, as distributors for its line of tandem rollers, three-wheel rollers, and graders.

Hobbs Equipment Co., 2021 W. Erwin St., Tyler, Texas; McNall Machinery & Supply Corp., 600 D Ave. N. W., Cedar Rapids, Iowa; and Hodge & Hammond, Inc., 720 Garrison Ave., New York, N. Y., will cover their respective territories. Minnesota sales will be handled by Ruffridge-Johnson Equipment Co., Inc., 3024 Fourth St. S. E., Minneapolis.

H. W. Moore opens branch

The H. W. Moore Equipment Co., Denver, Colo., has opened a branch office and shop at 2335 Grand Ave., Grand Junction, Colo. Manager of the new branch is Cecil Terrel; parts manager is Hank Nerheim.

Offering sales, repair service, rentals, and trade-ins, Moore handles many top lines of construction machinery.

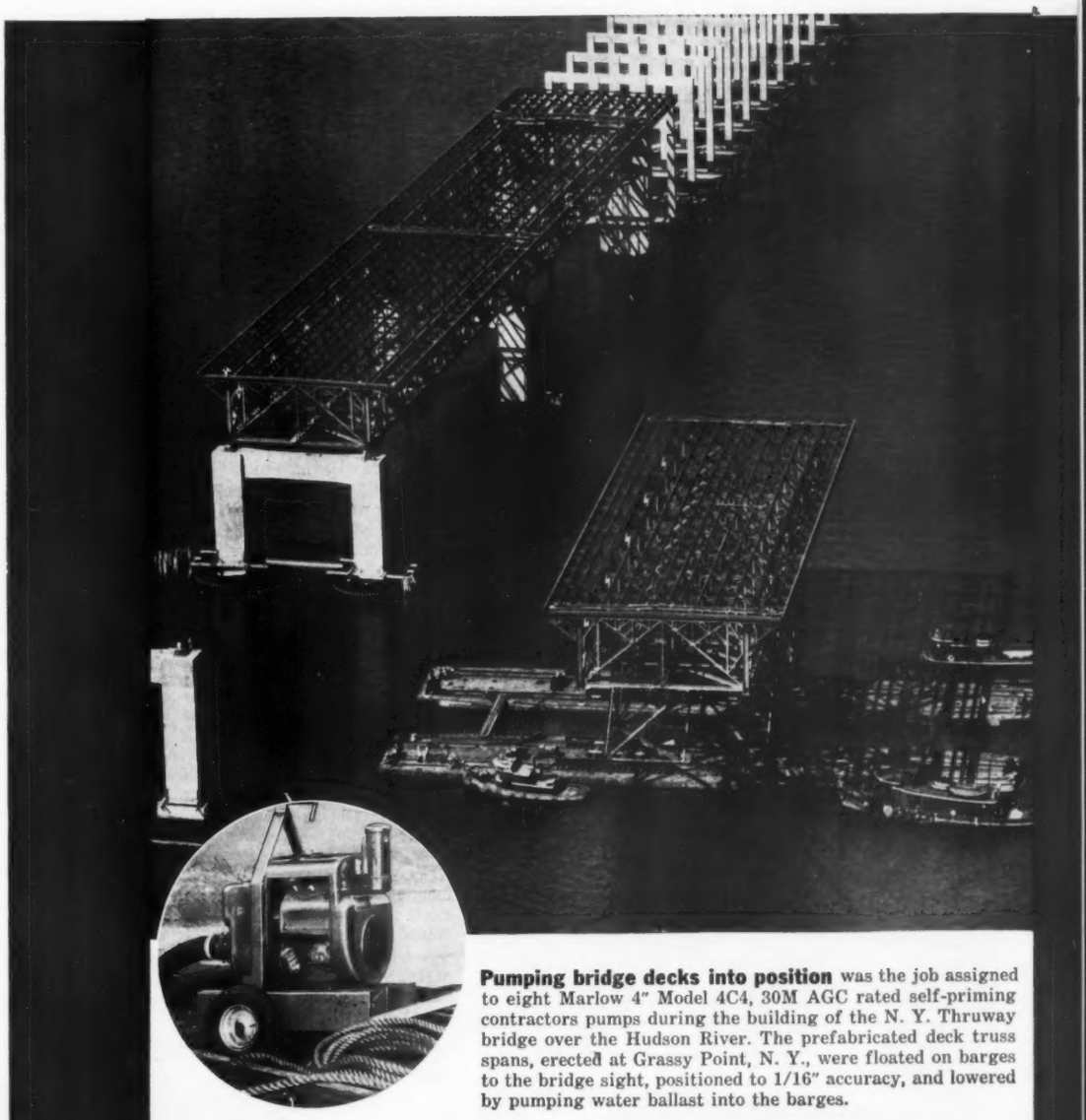
Euclid names two dealers

Two southern dealers have been appointed by the Euclid Division of General Motors Corp., Cleveland, Ohio, to handle sales, parts, and service on the complete line of Euclid scrapers, rear-dump and bottom-dump hauling equipment, the "Euc" loader, and the new TC-12 twin crawler tractor.

Representing the company in the

(Continued on next page, col. 4)

S. D. Means, vice president of Illinois Contractors' Machinery, Inc., Melrose Park, Ill., accepts a plaque awarded to the company as the top 1954 distributor of LeTourneau-Westinghouse equipment in either the U. S. or Canada. John W. Schoen, vice president and general sales manager of the Peoria, Ill., manufacturing firm, gives the award to Mr. Means at the annual presentation dinner. A duplicate plaque went to R. E. Dickerson, manager of the dealer's Peoria, Ill., branch.

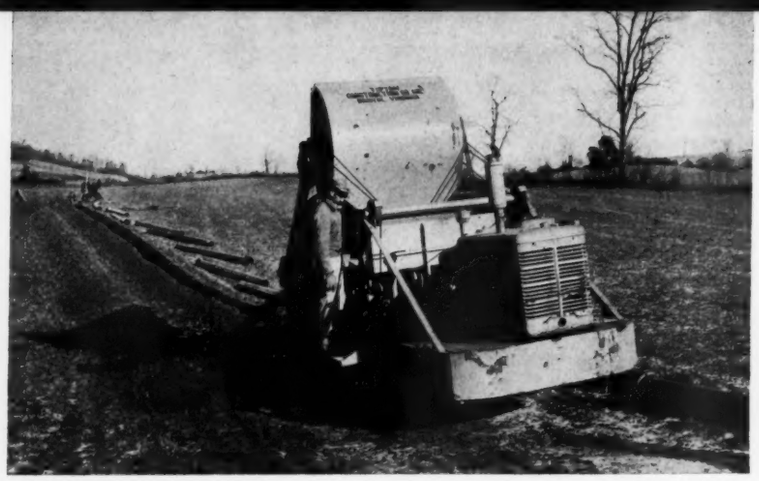


Pumping bridge decks into position was the job assigned to eight Marlow 4" Model 4C4, 30M AGC rated self-priming contractors pumps during the building of the N. Y. Thruway bridge over the Hudson River. The prefabricated deck truss spans, erected at Grassy Point, N. Y., were floated on barges to the bridge sight, positioned to 1/16" accuracy, and lowered by pumping water ballast into the barges.

marlows are dependable!

Contractors must bid *right* to get the job and make a profit. That's why they employ new methods and equipment to reduce costs. Contractors everywhere are buying more Marlows because they know they can depend on these rugged, dependable self-priming pumps to get the job done on time with little attention and low-maintenance costs. For complete details on these pumps, see your Marlow dealer or write for Bulletin C-04.

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY



Digging a 43-inch-deep trench for the 8-inch water main being laid in Chilhowie, Va., this Parsons Trenchliner is powered by an International UD-9 unit. The 18,000-foot-long ditch for the main is being handled by Tipton Construction Co., Bristol, Tenn., under a $41,000 prime contract.

Cutting through the rock of Kicking Horse Canyon in British Columbia, a Bucyrus-Erie 54-B shovel with 2½-yard bucket loads blasted material into one of the Tournapull rear dumps working on the $4 million Trans-Canada Highway.

It costs less to PUSH PIPE than dig ditches

cut job costs and installation time . . .
USE RODGERS HYDRAULIC JACKING UNITS

You'll cut pipe laying expenses and do the job faster and better by *pushing* pipe under highways, railroad tracks, and other obstructions. You'll avoid time-consuming ditching, backfilling, tamping and paving operations that delay the job and roll up the cost.

Rodgers Hydraulic Jacking Units can be used wherever you want to PUSH, LIFT or PULL. Multiple jack installations provide equal pressing or lifting power at all points and are ideal for raising or positioning large structural sections.

Photo shows a public utilities crew pushing a 16″ diameter steel pipe in 16-foot sections through 44 feet of earth. Two 150-ton capacity, 30-inch ram travel, double-acting Rodgers Jacking Cylinders are doing the job. A hand operated Rodgers Hydraulic Pump furnishes equal power to both jacks.

Rodgers Jacking Cylinders used singly or in groups provide steady, precisely controlled power to jack steel casing, corrugated pipe or compressed concrete tile—and they can be used for all types of accurately controlled lifting operations on structures.

Rodgers Jacking Cylinders are available in capacities from 50 to 600 tons with standard ram travels from 6 inches to 48 inches. Longer ram travels to 72 inches available on special order. Tunnel contractors are invited to inquire about our special hydraulic equipment for tunnel shield construction which includes a series of special hydraulic cylinders, power pumps and controls.

A selection of hand or power operated Rodgers hydraulic pumping units offer the exact jacking combination needed for your job. Let Rodgers engineering department assist you in your selections.

Rodgers Two Cylinder Power Driven Jacking Unit
MODEL NO. J150 A2 — 48 — D2

Send for your free copy of Rodgers Bulletin, 317A.
It contains a complete description of Rodgers Hydraulic jacking units, quick couplers, valves and hoses, also a description of hydraulic equipment used in the construction of tunnel shields.

---Rodgers Hydraulic Inc. 7415 WALKER ST., MINNEAPOLIS 16, MINN.

HYDRAULICS Rodgers KEEP THE WORLD MOVING

(*Continued from preceding page*)
entire state of North Carolina is Mitchell Distributing Co., Highway 19E. N., Spruce Pine. A branch office is located at 5405 Hillsboro Road in Raleigh.

Ray Long Equipment, Inc., 820 Blossom St., Columbia, S. C., will cover the entire state.

Three dealers named for Buffalo-Springfield

Road roller and compaction equipment manufactured by Buffalo-Springfield Roller Co., Springfield, Ohio, is being sold by a new distributor in Indiana—The Reid-Holcomb Co., Indianapolis. The dealership, which recently completed construction of a new 70×25-foot diesel-rebuilding shop and a 50×80-foot equipment shop, also handles Euclid, Lima, Insley, and Blaw-Knox equipment, as well as General Motors diesel engines.

The two other dealers for the Buffalo-Springfield line are Machinery, Inc., Charleston, W. Va., and Wilson Machinery & Supply Co., Lexington, Ky. The former company, which will cover southern West Virginia for Buffalo-Springfield, also handles American Hoist & Derrick, Lima, Chain Belt, Haiss, Kohler, and Schramm equipment.

Wilson Machinery & Supply, located at 561 W. Fourth St., Lexington, will handle Buffalo-Springfield sales in all but three Kentucky counties. The firm also operates a branch plant at 2601 W. Fourth St. in Owensboro, Ky.

Galion dealer in South

Complete maintenance and parts service as well as body and hoist-mounting facilities for Galion dump bodies and hydraulic hoists are now available at the Acme Spring & Equipment Co., Charleston, W. Va. The dealer, recently appointed by Galion Allsteel Body Co., Galion, Ohio, is located at 626 Maryland Ave., Charleston, and will serve the central part of the state.

Acme Spring carries a complete stock of dump bodies, hoists, and

Grade beams for a compressor station at Adaline, W. Va., are set in place in a narrow excavation. Cast with Blaw-Knox forms, the grade beams saved about two weeks' construction time on this building and on an auxiliary structure being built for a utility company.

Working closely together, a Rex paver and Flex-Plane finisher pave an 8-inch concrete expressway in Raleigh, N. C. The 1½-mile project, which is a four-lane road for most of its length, is being paved under subcontract by Rea Construction Co., Charlotte.

Load-evator hydraulic end loaders in Charleston and in its Columbus and Portsmouth, Ohio, branches. S. J. Kish, general manager, and R. Brown, sales manager, will supervise sales of the Galion line in Charleston.

Philadelphia distributor acquires Payloader line

Metalweld, Inc., heavy construction equipment dealer for the territory surrounding Philadelphia, Pa., has been appointed a distributor of the Payloader line of tractor-loaders by the Frank G. Hough Co., Libertyville, Ill.

Parts for payloader machines have also been added to the Metalweld parts department stock, now housed in a new building providing 4,150 square feet of storage space at the dealer's headquarters, Hunting Park Ave. and Fox St., Philadelphia.

Worthington dealership

The portable compressor and contractors' tool division of Worthington Corp., Harrison, N. J., has made Dove Creek Equipment & Supply Co., Dove Creek, Colo., a new distributor for the line of portable compressors and contractors' tools. The dealers will serve counties in Arizona, Colorado, and New Mexico.

Cleaver-Brooks dealer

The Dykes Co., 1012 Market St., Shreveport, La., is a new manufacturer's representative for the sale of boilers and equipment made by Cleaver-Brooks Co., Milwaukee, Wis. Northern Louisiana, northeast Texas, and southwest Arkansas make up the dealer's territory.

Everett trencher dealers

Three new dealers have been named for the Everett trencher made by Earth Equipment Corp., Los Angeles, Calif.

Northwest Georgia sales will be handled by Hill & Yancey, Inc., Atlanta. Modern Equipment Co., Jacksonville, Fla., will cover Florida and

(*Concluded on next page*)

THE *FORWARD* LOOK ...IN TRUCKS!

Dodge has changed the picture on performance, price!

Today there's a changed picture of truck power, payload, price! For example, do you know the answers to these 3 questions?

1—What trucks provide the highest horsepower of the 5 leading makes *in every conventional model,* ½-ton through 3½-ton?

2—What trucks have the highest payload in more models, 1½- through 4-ton, than any other leading make?

3—What trucks have the lowest factory retail price in more popular models than any other leading make?

In each case the answer is, "Dodge '*Job-Rated*' trucks" . . . the trucks with the Forward Look! Find out for yourself how Dodge trucks give you more visibility, more modern styling, more of everything you want in a truck. See your dependable Dodge Truck dealer now.

ALL-NEW

DODGE

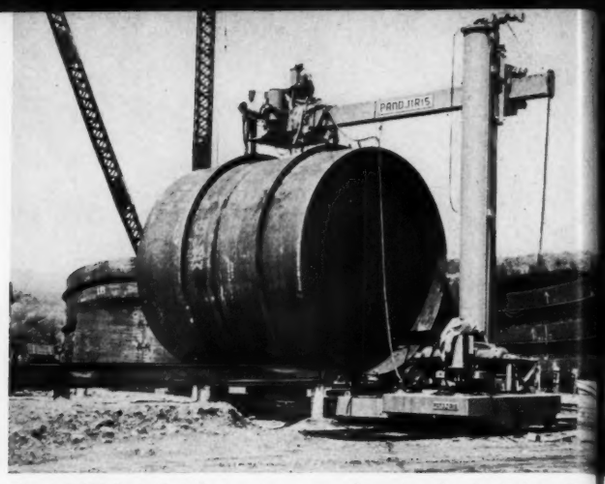
"Job-Rated"

TRUCKS

PRODUCTS OF CHRYSLER CORPORATION

CONSTRUCTION CAMERA

Culvert trenches, included in a $1,100,000 contract for a 10-mile concrete-paving job on U. S. 41 and 141 near Green Bay, Wis., are dug by a Koehring 304 truck crane with ¾-yard dragline bucket. J. R. Griffith Co., Inc., Racine, Wis., also used the rig for setting the reinforced-concrete culvert pipe on this job.



About 3,500 feet of girth seams on penstock sections for the Littleton Dam Littleton, N. H., are being welded with a Pandjiris Weldment Co. RB welding head manipulator. The unit makes joints ranging from 16½ to 19½ feet in diameter, completing about 20 inches of seam per minute.

(Continued from preceding page)
the southeastern section of the country. In North and South Carolina, the Everett trencher will be sold by Carolina Ford Tractor Co., Charlotte, N. C.

Pacific Northwest firm named by Harnischfeger

The diesel engine division of Harnischfeger Corp., located at Crystal Lake, Ill., has made Apex Marine & Equipment Co., Seattle, Wash., a distributor of P&H diesel engines in the Pacific Northwest area.

The Apex firm now occupies a new building at 2100 Westlake North, on the shore of Lake Union, which has larger sales and service facilities than its former headquarters.

Book studies legal aspects of utility relocation

An analysis of extensive research into the legal and judicial aspects of public-utility relocation in connection with highway improvement has been published by the Highway Research Board as Special Report 21.

The 200-page book contains an analysis of more than 250 of the most important judicial decisions and all statutory and constitutional provisions affecting the relocation of public utilities. Under study are the rights of public authorities, the rights of utility companies, the ramifications of police power, the character of the federal-aid road-building program, and the position of railroads—all as they are affected by utility relocation.

"Relocation of Public Utilities Due to Highway Improvement", HRB Special Report 21, is priced at $6 per individual copy, and may be ordered from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

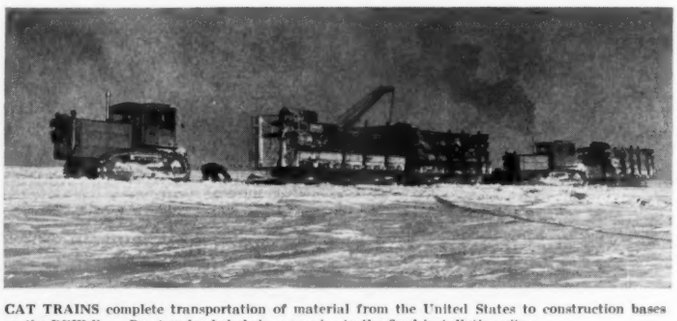
Concrete bucket

On the May cover of CONTRACTORS & ENGINEERS, the Heltzel bucket dumping concrete to bins during construction of the Ford Motor Co. plant in Dearborn, Mich., was incorrectly identified.

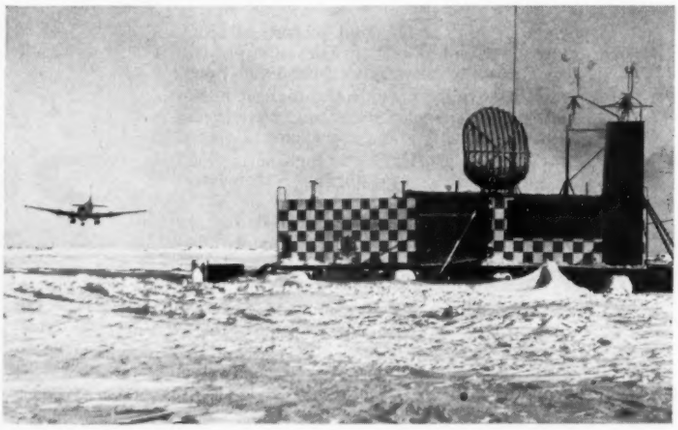
CATERPILLAR

REPORT ON BUILDING THE DEW LINE

On the rim of the world, construction men... using airlifts, Cat-powered tractor trains, and ingenuity... are buying the nation precious time against a sneak H-bomb attack



CAT TRAINS complete transportation of material from the United States to construction bases on the DEW line. D8s tow loaded sleds across ice to the final installation sites.



C-124 GLOBEMASTER, loaded with material for the Cat trains, approaches for a landing on a snow-covered landing strip. This strip was carved out by Caterpillar-built Bulldozers which cut snow down to bare ice.

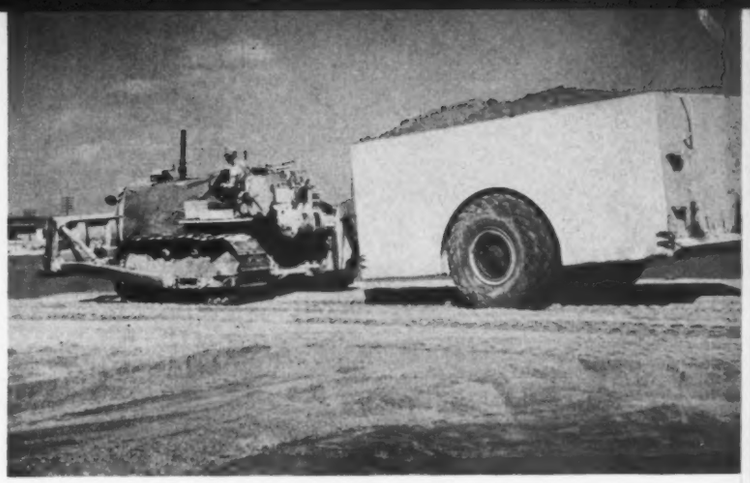
Eighteen hundred miles north of Chicago, temperatures plunge to 70 below, blowing snow cuts visibility to zero, and sparse vegetation shatters like glass. Here construction men and machines are battling to carve out the world's greatest Arctic defense project —the Distant Early Warning (DEW) line, a joint U. S.-Canadian venture.

When finished they will have wrung from the Arctic wastes vital extra warning time against a sneak aerial attack. An uninterrupted line of radar stations will maintain a never-ending vigil.

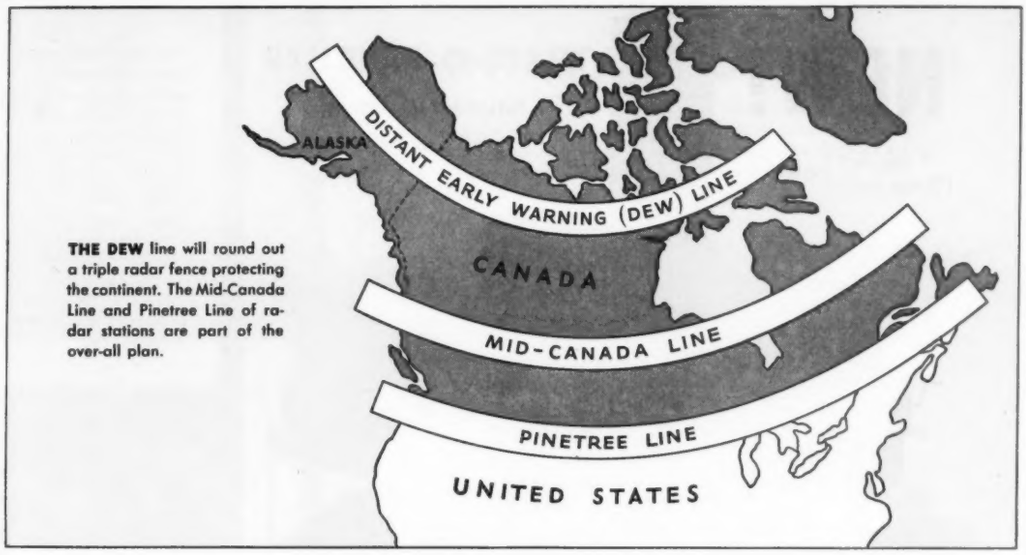
Men and material began moving swiftly and silently inside the Arctic Circle early this year. Ice roads and complete camps were built where none existed a few weeks before. Men and machines had moved in by airlift and CAT*-powered tractor trains.

That was the end result of two years' research and study spearheaded by Western Electric, Bell Telephone System's manufacturing and supply unit. In February, Western Electric

Cofferdams for elevator and transformer wells, built of lightweight steel sheet piling supplied by L. B. Foster Co., are driven to rock for the 8-story University Square apartments in Pittsburgh, Pa. Two men do the work with Thor hammers, equipped with special heads, which eliminate the need for a pile-driving rig.



Eight passes by a Grace compactor, loaded to 100,000 pounds and pulled by a Cat D8 tractor, compact soil during tests at the new Air Force Academy site near Colorado Springs, Colo. Work on the $125 million facility is set to begin this month, and road construction is scheduled to be finished by the end of the year.



THE DEW line will round out a triple radar fence protecting the continent. The Mid-Canada Line and Pinetree Line of radar stations are part of the over-all plan.

was named prime contractor for the DEW line construction. Subcontractors include Puget Sound Bridge and Dredging Company and Johnson, Drake and Piper, Inc., both of Seattle; the Northern Construction Company and J. W. Stewart, Ltd., of Vancouver; and Foundation Company of Canada, Ltd., of Montreal.

Backbone of each of the spreads is Caterpillar* Arctic-proof equipment. It has proved itself building Thule Air Base in Greenland. It has hauled supplies for the Naval Petroleum Exploration Program at Point Barrow. For decades it has served the commercial needs of industry of the north in mining, construction, pulp and similar operations.

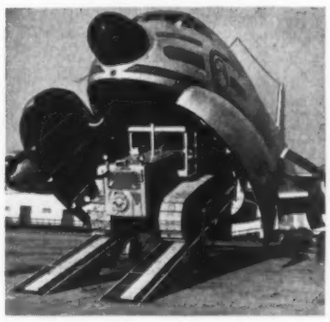
To get the job done it was natural for DEW line subcontractors to rely on their fleets of D4s, D6s, D8s, No. 12 Motor Graders, Traxcavators*, Cat Scrapers and Electric Sets.

Cat trains moved above the Arctic Circle making landing strips and blazing new snow roads through the meager stands of hoar-frosted vegetation which reacted like glass when snapped by bulldozers. Other Cat units followed, flown into the landing strips in the Air Force's big airlift, "Operation Big Haul."

Altogether 6600 tons of tractors, buildings and other heavy equipment were brought in by the Tactical Air Command's 18th Air Force. At the airstrips, construction crews put together hundreds of small prefabricated buildings and bolted them to rounded timbers which served as sled runners. Trains of them were towed by Caterpillar track-type Tractors to various Arctic sites.

All big yellow machines have been winterized to withstand temperatures as low as 70 below. The foresight has paid off. On February 15, nine D8s, all equipped with Caterpillar's new oil clutches, were at a point where the mercury dropped to an all-time low of 76 below! *No trouble was reported!*

A few refinements have been added, such as escape hatches for operators of tractors in the event they drop through the ice.



A D8 is pulled aboard a Globemaster as part of the DEW line airlift at an Alaskan base. Tractors made up a good part of the 6600 tons of cargo which the Air Force flew to advance bases.

Today, north of the Arctic Circle, the painstaking research which goes into all Caterpillar equipment is paying off. For on this vital project . . . on this toughest of all proving grounds . . . only the most dependable equipment can be trusted. Once again the choice has been Caterpillar.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS, U. S. A.

*Cat, Caterpillar and Traxcavator are registered trademarks—®

Engineering manual on Lift-Slab method

The relatively new construction process which positions concrete slabs for building floors and ceilings through the use of hydraulic lifting jacks is detailed in the "Lift Slab Engineering Manual" compiled and being made available by the United States Lift Slab Corp., Austin, Texas. The manual is primarily for the use of structural engineers and architects.

Sections of the manual are devoted to structural design, advanced analysis, practical aspects of the method, and a list of projects on which the method has been used. Economy of the method, use of reinforcing, aspects of column design, foundation design are among subjects treated in detail.

Tables, diagrams, and other explanatory illustrations help to detail the new method, developed by architect Phillip N. Youtz and Thomas B. Slick. The manual has been prepared by consulting engineers of the United States Lift Slab Corp.

Priced at $5, the manual may be ordered from the United States Lift Slab Corp., Perry-Brooks Bldg., Austin, Texas.

ACCO elects C. N. Johns chief executive officer

Stockholders of the American Chain & Cable Co., Inc., elected Cyrus N. Johns to the post of chief executive officer of the company. President of the firm since 1951, Mr. Johns succeeds Wilmot F. Wheeler.

Associated with Page Steel & Wire Co., Monessen, Pa., before its acquisition by American Chain & Cable, Mr. Johns served there as works manager and later as general manager of that division. In 1940, he was appointed vice president in charge of all ACCO plants, and in 1951 was named executive vice president.

In other executive changes, Arthur C. Laske, secretary of the firm, was named to succeed the retiring Stanley Mann as treasurer. He will also retain the post of secretary. Wilmot F. Wheeler, Jr., assistant to the president since 1953, was elected a vice president.

CONSTRUCTION CAMERA

A 4-yard bite of rock is emptied into a Euclid bottom-dump by a Lima 1601 shovel in the Azusa Rock & Sand Co. pit located at Azusa, Calif. Both of these units work a 15-hour day at the site. A Cummins 400-hp torque converter powers the shovel, and the Euclid is equipped with a Cummins 200-hp diesel.

Holes bored in the deck of the 5th St. bridge, Long Beach, Calif., perm pier concrete to be placed after the deck has been raised in 10-foot se tions. The transit-mix concrete, delivered by Gar-Bro Power-Cart, is dumpe directly to a collection hopper equipped with an elephant trunk.

Oklahoma use tax affects out-of-state purchases

To the Editor:

CONTRACTORS AND ENGINEERS

In your May issue, page 77, appears a case under "Avoid Legal Pitfalls" titled "Sales Tax Not Due on Goods Entering State".

We have checked with the attorney for the Oklahoma Tax Commission in this case, Harding Vs. Oklahoma Tax Commission, and we wish to advise you that your article is misleading in that it would give one the idea that he can purchase materials and supplies without Oklahoma and bring them into Oklahoma without being obligated for tax.

While the material Harding purchased without the state and imported for use in the contract mentioned may not be subject to Oklahoma *sales* tax, it was subject to Oklahoma *use* tax and, according to the attorney for the commission, was so ruled by the Supreme Court.

Sincerely yours,

R. L. Eastwood

Guy H. James Construction Co.,

Oklahoma City, Okla.

(After re-examining the Oklahoma Court decision, I find that the court decided that materials purchased out of state used or consumed by a contractor, are subject to a use tax. Mr. Eastwood's letter correctly reflects the court's decision.—Arthur L. H. Street.)

J. P. Buehler joins Bechtel as executive engineer

John P. Buehler has been appointed executive engineer for the Bechtel Corp., San Francisco, Calif. Assigned to the power division in San Francisco, Mr. Buehler will assist vice president John R. Kiely on special studies of hydroelectric power.

Mr. Buehler, a former colonel in the U. S. Army Corps of Engineers, formerly directed many large water developments and hydroelectric projects. As Seattle District Engineer, Mr. Buehler was responsible for the design and construction of the Chief Joseph Dam on the Columbia River and the Alberni Falls Dam on the Pend Oreille.

NEW!

TRAIL-O-PATCHER

Bituminous Mixer

7 ton hot / 12 ton cold } capacity

The first self-contained one, all-weather bitu mixer. It's the first all-da thanks to its huge 20 asphalt tank. Has its o men metering syste aggregate drying comp Does such a thorough job, it's practically du

Littleford designed neered and built, the n O-Patcher is your most answer to the rising cost maintenance. Send to bulletin 28.

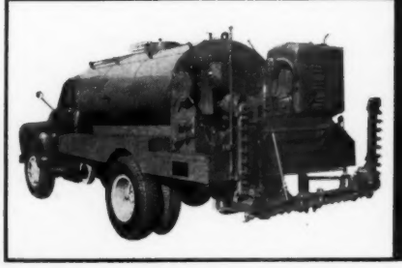
LITTLEFORD

paves the way for lower c ad

NEW!

Model D

SPRAY LEADER



State highway departments like the new Spray Leader . . . b it's the ***first low cost distributor*** you can buy with the right of equipment for your requirements—no more, no less. A the Model D you get ***your choice of two types of circ spray bars:*** automatic or mechanical. Most important, th Leader has the same operating system used in the more ex Littleford distributors. It's a good, basic distributor . . . yo buy. Send today for free descriptive bulletin 14-D.

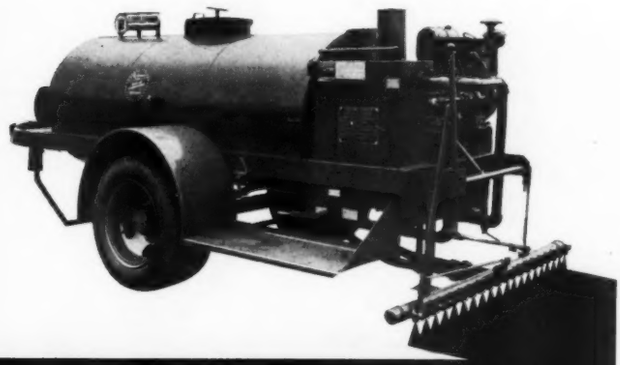
Concrete for a railroad overpass on the Ramona Freeway in California is placed by a Lorain 30-ton Moto-Crane with 50-foot boom. The rig is also used for digging foundation trenches, laying pipe, and handling material on the 5-mile section being built near El Monte by Peter Kiewit Sons' Co., Omaha, Nebr.

A 60,000-yard gravel-crushing job is turned out in 60 days for the Montana State Highway Commission by this Pioneer 46-VE plant setup near Lakeside, Mont. The crusher, powered by a Caterpillar D13000 diesel engine, is equipped with a 10 x 36 jaw crusher, 40 x 22 roll crusher, and 4 x 12-foot 3½-deck vibrating screen.

ur choice of mountings:
ck mounted type (above),
wheel trailer (right), or
wheel trailer. Wider choice,
ter buy!

101 UTILITY SPRAY TANK!

Single unit does any kind of patchwork. The Littleford 101 comes equipped with (1) a circulating spray bar up to 10-ft. wide for small application jobs . . . (2) a hand spray attachment for patching by hand . . . and (3) there's an outlet for filling pouring pots for small crack and joint filling. Get the facts before you buy . . . send for bulletin 5.



RROAD EQUIPMENT

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TUMINOUS SUPPLY TANK 102

ford supply tanks are your most efficient means of
ng hot or cold bituminous materials from the source
ur Littleford Bituminous Distributors, Trail-O-Distrib-
, stationary or traveling mixing plants, bulk storage
sphalt mixing machines. Model 102 shown below.
complete information, write for bulletin 25.

BITUMINOUS SUPPLY TANK 103

Littleford engineered and quality built, these tanks will last for years, cost you less to own and operate. Model 103 tandem axle design shown above.

Equipment with BUILT-IN ENGINEERING LITTLEFORD

LB BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE · 1905 LITTLEFORD

LITTLEFORD BROS., INC.
485 E. Pearl St., Cincinnati 2, Ohio

Edward Holmes made head of research for BPR

The new deputy commissioner in charge of research for the U. S. Bureau of Public Roads is Edward H. Holmes. He replaces Herbert S. Fairbank, who has retired after 12 years in the post.

An authority on the factors determining highway capacity, Mr. Holmes was formerly chief of the Highway Transport Research Branch. He began work with the bureau following his graduation from the Massachusetts Institute of Technology in 1928. After a year's leave of absence to complete a course in traffic engineering at Harvard University, Mr. Holmes initiated and directed traffic-capacity studies for the bureau.

Owen made area engineer for The Asphalt Institute

A University of Arkansas graduate instructor in civil engineering, Charles V. Owen, last month joined the field engineering staff of The Asphalt Institute, College Park, Md. He will work as an area engineer in Kansas and Nebraska, under the supervision of district engineer Merritt R. Royer. His main duties now will be in conducting studies in connection with the construction of the new asphalt pavement for the Kansas Turnpike.

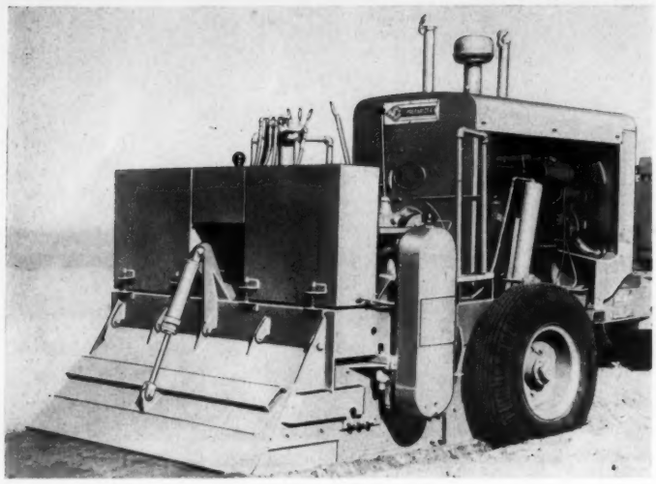
Miller SWIVELS for Blocks

As adapted to blocks, MILLER Ball Bearing Swivels prevent loads from spinning and fouling the lines. Miller Swivels turn freely under heaviest loading (capacities to 250 tons). Small Miller Swivel on dead end simplifies restringing —no line twist or kinking.

Let us work with you to adapt Miller Swivels to your particular needs.

Write for Catalog and Prices

GENERAL MACHINE and WELDING WORKS, Inc.
P. O. BOX 938, POMONA, CALIFORNIA



The Pettibone Wood P-600 Preparizer. ▼

Road-mix machine features increased power

■ An increase of 30 per cent in power for its P-600 Preparizer has been announced by Pettibone Wood Mfg. Co., Box 620, 6900 Tujunga Ave., North Hollywood, Calif., manufacturer of roadmixers and other road-building equipment.

Other improvements in this scarifying and pulverizing unit is a dual drive to both ends of the rotor shaft, equalizing the delivered power and providing positive and more evenly balanced power transmission.

The drive transmission has four rotor speeds. Reversed rotor operation enables the machine to pulverize harder materials than it has been possible to process heretofore. Fuel tanks, set on shockproof mountings, are now located at the rear of operator's platform. This gives the operator easy access to controls and an unobstructed view. Wheels are equipped with depth gages to control depth of cut or pickup.

For further information write to the company, or use the Request Card at page 18. Circle No. 278.

Direct shear tester

■ The relationship between shear strength and normal stress on a confined soil sample can be determined quickly and accurately with the new Tinius Olsen Model K-W direct shear machine.

Any desired load up to 8 tons per square foot on a 2½-inch-diameter sample can be obtained with this new self-contained unit. Rings of capacities up to 500 pounds allow this versatility in setting up testing conditions. Load applied directly by air pressure through a floating metallic bellows eliminates the use of weights and a lever arm.

Light and compact, the entire testing unit occupies only 2½ square feet of space.

The Tinius Olsen K-W direct shear tester.

For further information write to Tinius Olsen Testing Machine Co., 245 Easton Road, Willow Grove, Pa., or use the Request Card at page 18. Circle No. 258.

Prefabricated buildings of steel construction

■ Portable and stationary steel buildings are illustrated in a booklet from Arrowhead Steel Buildings, Inc., 367 Garfield Ave., Duluth 6, Minn. Arrowhead offers a complete design and specification service, and has facilities for producing custom-built and prefabricated structures.

Sheets or covering materials are economically manufactured in panels at the Arrowhead factory under controlled conditions. On smaller buildings, the concern erects the entire structure in the fabrication shop and delivers it to the site to be placed on the foundation.

The booklet discusses details of typical ArroPanel components, such as dimensions, insulations, exterior and interior coverings, and framing members.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 273.

Exactly what job needed

FOSTER RENTAL PILING

Prompt and exacting Piling Service from Foster helped speed-up construction of the foundation for the new science hall on the University of Pittsburgh campus.
Pile driving contractors Equipment & Supplies, Inc. got exactly what was needed for the job—by renting specific lengths of MZ-27 steel-sheet Piling—and, at the same time, renting 10" H-Bearing Pile which was used for waling and supports.
Get complete piling service from Foster — the right type and exact section of Piling in the lengths you need —and, *when you need it.*

Foster Piling waled and braced with H-Bearing Pile for the foundation of the
GEORGE HUBBARD CLAPP SCIENCE HALL
UNIVERSITY OF PITTSBURGH

Save on All Your Piling Needs
RENT from L. B. FOSTER CO.

Foster's Rental Plan provides a low, fixed expense — gives you an added advantage in bidding, and prompt, exacting service on your piling requirements for every job.

STEEL-SHEET PILING • H-BEARING PILE
H-S LIGHT WEIGHT PILING • PIPE PILES

FASTER from FOSTER — Write for Catalog C-7

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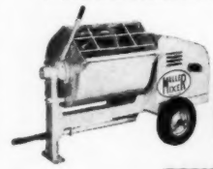
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 5 • HOUSTON 2 • LOS ANGELES 5

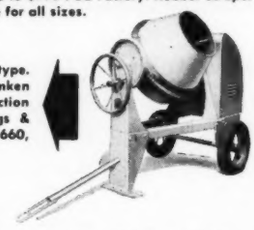
MULLER MIXERS *and* POWER TROWELS
set quality standards in their fields

Muller's earliest objective—to make the best possible plaster and mortar mixer and sell it for the lowest possible price—was achieved by: (1) specialization on a few models . . . (2) careful selection of materials and components . . . (3) experienced workmanship . . . (4) sound distribution methods. Other Muller Machines, also, rank high in their fields for the same reasons.



PLASTER AND MORTAR MIXERS
Made in 2, 3½, 6, 6 to 8, and 9 cu. ft. sizes. Electric motor or gas engine power. All models have Muller Lifetime Paddle Shaft Seal to protect bearings. Power throwouts on smaller models, built-in disc clutch on larger. Many other features. Priced $180 to $996 FOB Factory. Rubber scraper blades are available for all sizes.

CONCRETE MIXERS
3 models, 3 to 6 cu. ft. capacities, tilting type. Ample size drums, fast mixing action, Timken Bearings, electrically welded, sturdy construction throughout. Power—electric motor or Briggs & Stratton Air Cooled Engines. Prices $230 to $660, FOB Factory.



POWER TROWELS
2 sizes—29" diameter, 1¾ HP; and 34", 2¼ HP Briggs & Stratton Engines. Stationary guide ring eliminates hand troweling when finishing along baseboard. Engine speed regulated by governor control on handle.

SEND FOR INFORMATION FOLDERS AND NAME OF LOCAL DEALER

MULLER MIXER — MULLER MACHINERY COMPANY, Inc. — Metuchen 15, New Jersey — Cable Address, MULMIX

AND NOW — STONE
You never know where to look for an Eagle Truck Mounted Loader — it loads most anything anytime, anywhere. Windrow dirt, snow — or stockpiles of cinders, sand or stone — puts them aboard the truck at the rate of 3 to 5 yards per minute with only one man at the helm.

Glad to send you details! Ask for folder 252-172.

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JAW CRUSHERS • IMPACT BREAKERS
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CRUSHER CO., Inc. GALION OHIO·U·S·A

Elevating grader with long-length conveyor equipped with outrigger

■ A new long-length elevating grader attachment with a specially-designed outrigger has been announced by Reisser Corp., Blair, Nebr. The new Elegrader with a 42-inch troughing belt is a 27-foot-long unit consisting of a standard 16-foot carrier and an 11-foot extension. With an added 3-foot extension, the length can be increased to 30 feet.

The conveyor can also be adjusted to 16, 19, or 22-foot lengths, and requires no outrigger when used in these shorter dimensions. However, at the 27 or 30-foot length, the outrigger provides the stability and balance required for the elevating grader's rated capacity of 800 cubic yards per hour. Better weight distribution between the motor grader and the upper carrier counteract the off-side pull of the outrigger. Clearance under head pulley guards is 11 feet 6 inches.

The new attachment has been adapted for both the Adams and Caterpillar motor graders.

Mounted on tandem caster wheels, the outrigger is attached to the grader with 3 bolts in such a way that both the grader and the outrigger can adjust to variations in ground level. The outrigger's tandem-wheel assembly can oscillate freely up to 24 inches.

For job-to-job moves, the outrigger and conveyor have been designed to form a single unit pulled by the grader or any other available prime mover. A quickly-connected drawbar is attached to the lower portion of the conveyor, and the tandem caster wheels are turned 90 degrees and pinned. With the boom lowered and the cables and chains disconnected, the carrier is then rolled out on its own wheels and attached to the drawbar of the towing vehicle.

This entire operation takes two men less than two hours. The only special tools needed are a jack and a pickup truck. Trailing dimensions of the elevating grader are: width, 8 feet; height, 9 feet 7 inches; and length, 31 feet 8 inches.

For further information write to the company, or use the Request Card at page 18. Circle No. 335.

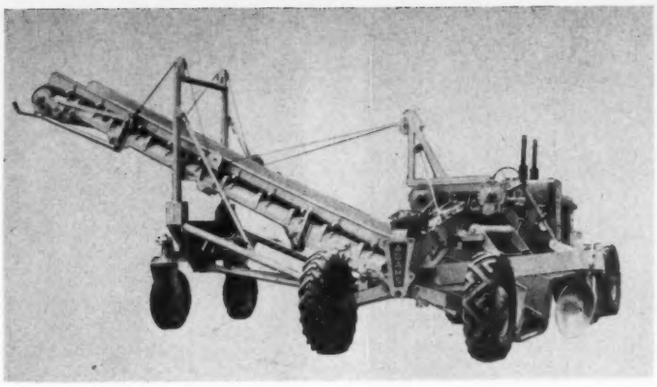
Asphalt-paving tools

■ The Iroquois line of asphalt-paving tools is illustrated in a leaflet from Posey Iron Works, Inc., Lancaster, Pa.

The literature shows asphalt smoothers and tampers that are designed to withstand repeated heating and to retain heat. Base dimensions of these tools are $10\frac{1}{2} \times 6\frac{1}{2}$ inches and 6×8 inches, respectively.

An asphalt rake illustrated has a head 4 inches deep and $15\frac{1}{2}$ inches wide. It is designed especially for raking hot sheet asphalt and other blacktop materials. Also shown are asphalt and tar dippers in 6 and 9-quart models, as well as asphalt shovels and pouring pots.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 308.



◄ An outrigger provides this new Elegrader with stability when it is extended to conveyor lengths of 27 or 30 feet.

Concrete paving spreader

■ Specifications for the Blaw-Knox Model SD concrete paving spreader and vibrator are detailed in a new bulletin from the Construction Equipment Division, Blaw-Knox Co., Pittsburgh 38, Pa.

Along with engineering data, the literature includes pictures of the spreader at work on the New York Thruway, the Ohio Turnpike, and other well-known construction jobs.

Introduced in 1941, the spreader is suitable for both road and air-base concrete spreading.

To obtain Bulletin No. 2485 write to the company, or use the Request Card at page 18. Circle No. 339.

Buy U. S. Defense Bonds

ENGINEERED ESPECIALLY FOR TOUGH CONSTRUCTION DUTIES

performs on-the-job handling - faster - better - easier!

This new Prime-Mover built specifically for construction work provides practical answers to building contractors problems.

FOR EXAMPLE:

1. **Length of only 64 inches and 31½ inch width permit easy maneuverability where more cumbersome equipment cannot go.**
2. **Compact size allows operation over the same ramps, runways, hoists and towers commonly used.**
3. **Positive controls let even the inexperienced laborer operate the unit safely and efficiently.**
4. **Interchangeable bucket and flatbed increases cost-saving usefulness.**
5. **Dependable engine and proved transmission insure continuous service.**
6. **Recoil starter, large fuel tank, sealed-in lubrication, natural position steering bars, are added improvements.**

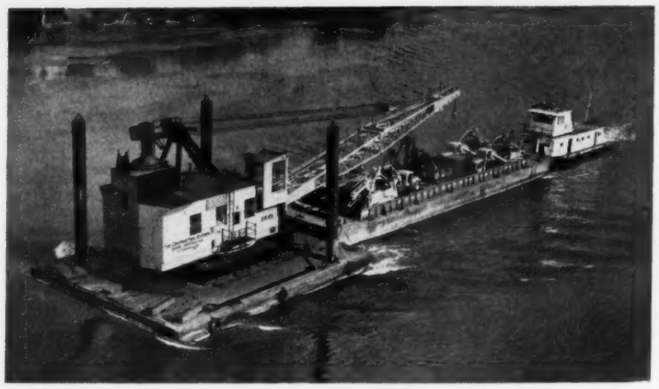
These features and improvements mean a Prime-Mover that gives you ready-to-go power for handling any material — anywhere on the job. Prime-Mover distributors are ready to demonstrate. See yours or write us

A Prime-Mover will place 12 to 17 cubic yards of concrete per hour, 10 cubic feet per trip.

A Prime-Mover will haul up to 300 bricks direct from yard to bricklayer. 1500 lbs. per trip, up 20% grades.

PRIME-MOVER

THE PRIME-MOVER CO., MUSCATINE, IOWA



One of Dravo Corp.'s two new derrick boats is push-towed by a 70-foot tow boat, along with a bargeload of equipment. The large-capacity derrick boats feature aluminum-alloy booms with a working length up to 200 feet, and single-line cable pulls up to 50 tons. For details circle No. 340 on card at page 18, or write to Dravo Corp., Neville Island, Pittsburgh 25, Pa.

This Highway earth-boring machine is designed to dig holes from 9 to 20 inches in diameter and from 7 to 10 feet deep. The Model HD, which can be mounted on either a truck or a tractor, adjusts to dig at any angle. With optional integral winch and pole derrick, it handles 40 to 45-foot poles. For details circle No. 341 on card at page 18, or write to Highway Trailer Co., Edgerton, Wis.

Rubber-cement mix for industrial flooring

■ A new concrete-type industrial flooring and construction material has been developed by Naugatuck Chemical Division, U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y. The material, a combination of liquid rubber and a special cement powder, is called Laticrete. The manufacturer reports that it does not crack under heavy loads, dampens shock and noise, resists alkalies and mild acids, is waterproof and is nonslip.

Applied as a surface coating, it can be used for repair work or in new installations. The coating is reported to have good adhesion to concrete, metal, and even glass. A quarter-inch layer, the suggested thickness, will support heavy loads such as fork-lift trucks.

The light gray mix can be pigmented in a wide range of colors.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 269.

Tractor-loader features overhead bucket travel

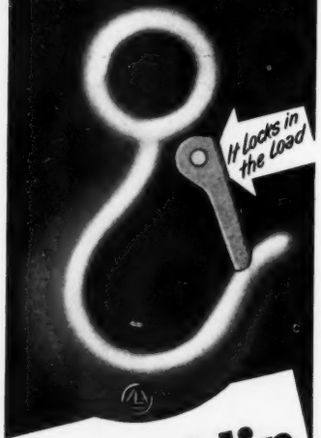
■ A brochure describing the Merton Overloader, an overhead-loading tractor-loader, has been issued by the Seaboard Equipment Co., Inc., 7 Hanover St., New York 5, N. Y.

The Merton features fast straight-line loading and variable-height discharge. Its method of handling bulk materials is discussed in detail.

The brochure also includes application suggestions, actual performance reports, information on optional equipment, and complete specifications.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 203.

The SAFEST HOOK You Can Buy!



Laughlin SAFETY HOOK

DROP FORGED — HEAT TREATED
½ ton to 15 ton capacity

To help you order from your local distributor send for complete catalog.

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American Hoist and Derrick Co.
DEPT. 146, Portland, Maine

Please send me catalog of your complete wire rope and chain fitting line.

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PORTABLE ASPHALT PLANT

MODEL L-8, 10-15 TON CAPACITY

Stationary Plants L-12 and L-25, 15-30 ton capacity.

A COMPLETE ASPHALT PLANT ON ONE CHASSIS . . . DRYER, MIXER, HEATING KETTLE. Low in cost, small enough to tow, BIG enough to produce HOT mix, (or any other bituminous mix) for driveways, parking lots, street maintenance, etc. Equipped with 50 HP LeRoi engine, air operated gates for *one* man control, divided compartment, reciprocating feeder for proportioning aggregate. Available as stationary plant with 30 HP electric motor.

Write for catalog and name of nearest dealer.

White MANUFACTURING COMPANY

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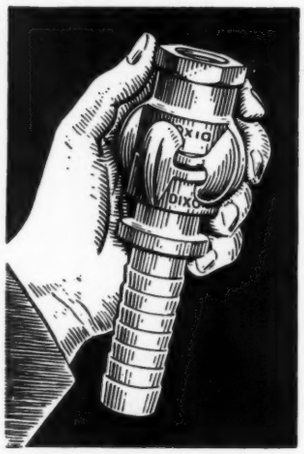

THIS *Versatile Coupling*

while used primarily for air-operated tools in field and factory, is equally efficient for water, oil and spray service. Illustration shows hose end and female I.P.T. end connected.

"AIR KING" QUICK ACTING UNIVERSAL HOSE COUPLING

Heads are locked by pressing together and giving quarter-turn. These locking heads are identical for all sizes of hose or threaded ends, permitting the coupling of any two sizes of hose, or hose and pipe, within the "AIR KING" size range. Equipped with patented safety locking device. Bronze or rustproofed malleable iron, in sizes up to 1".

Two Hose Ends Connected — Male I.P.T.End

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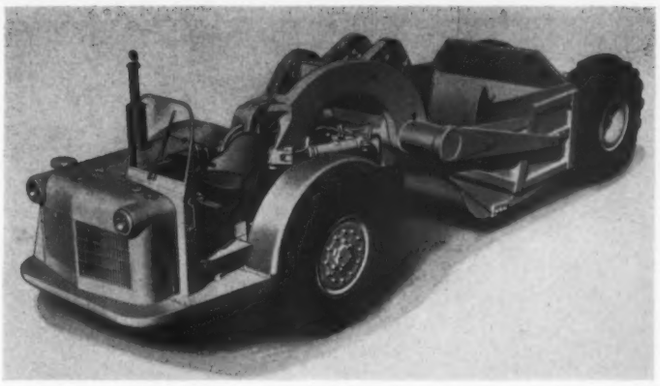
DIXON Valve & Coupling Co.

GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies
Buck Iron Company Inc., Guaymire, Pa. · Precision Drawn Steel Company, Canton, O.

This LeTourneau tree-stinger is outfitted with low-pressure 65-inch nylon tubeless tires, first of a complete line of Goodrich earthmover tubeless tires that will soon be marketed. Because of their width and low pressure, the tires will provide superior traction and flotation in sandy soil. For details circle No. 342 on card at page 18, or write to B. F. Goodrich Co., Akron, Ohio.



Euclid's S-7 motor scraper, announced late last year (see C&E, Oct., 1954, pg. 16), is now in production. Powered by a 143-hp diesel engine, the hydraulically-controlled S-7 is the first overhung-engine Euclid scraper available. Struck capacity is 7 cubic yards. For details circle No. 343 on card at page 18, or write to Euclid Division, General Motors Corp., Cleveland 17, Ohio.

Reinforced concrete in home construction

■ A booklet on the advantages and economy of reinforced concrete in home construction is being distributed by Wire Reinforcement Institute, Inc., 1049 National Press Bldg., Washington, D. C. The booklet describes the use of welded wire fabric—the most commonly used reinforcement for home concrete construction—to preserve the life of concrete.

To obtain Booklet WRI, write to the institute, or use the Request Card that is bound in at page 18. Circle No. 242.

Sump pump kept dry to minimize maintenance

■ Designed for mounting high above the pit, a new Gorman-Rupp self-priming sump pump eliminates many pump maintenance problems. With only the suction line and strainer guard in the sump, the Model 81¼-AE pump keeps dewatering until the job is finished. The pump may be remotely located, if desired.

The new pump has straight-in suction with no check valve. The elimination of entrance restrictions increases priming lift and efficiency. Fewer working parts minimize maintenance and service.

Suction and discharge are 1¼ inches in size. Typical performance is 3,000 gallons at a total head of 10 feet, or 1,800 gallons at a total head of 25 feet.

The power unit is a standard, face-mounted, 1/3-hp 115-volt 60-cycle 3,450-rpm electric motor. Automatic controls start and stop the pump at predetermined water levels. Float switch or electrodes may be used.

For further information write to Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 236.

VULCAN
Pile Extractors Pull Toughest Piles

Specialized power for pulling the heaviest, longest, and most difficult steel, concrete, and wood piling. Simple, durable, efficient. Only one moving part . . . requires no assembly or adjustment . . . can't get out of order.

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327 NORTH BELL AVENUE
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Manufacturers of Pile Driving Hammers and Pile Extractors since 1852

There's Extra Economy on Construction Jobs That Use . . .

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POWER TOOLS

"Belt Driven"
ELECTRIC SAWS
Rugged, powerful saws for cross-cutting or ripping hard or soft wood at top speed without bucking or pulling. Used for production cutting of concrete block, plaster board, etc. Two Models with 8" or 10" blades—2-13/16" and 3-1/4" cuts.

"Electric"
HAMMER DRILLS and HAMMERS
Automatic, self-rotating Hammer Drills that cut through concrete ten times faster than by hand. Electromagnetic operation - practically no maintenance. Electric Hammers for low cost cutting, chipping, pointing, scaling, etc.

"Self Contained"
GASOLINE HAMMERS
PAVING BREAKERS and ROCK DRILLS
Require no air compressor or accessories. Deliver 2000 powerful blows per minute for digging, tamping, busting or drilling in paving, clay, shale, rock, etc. Bit rotates automatically for drilling.

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CONCRETE VIBRATORS
Electromagnetic models that clamp directly to sides of wall forms for high speed settling on form jobs. Gasoline or electric models for mass vibration.

Write today for complete tool catalogue - FREE

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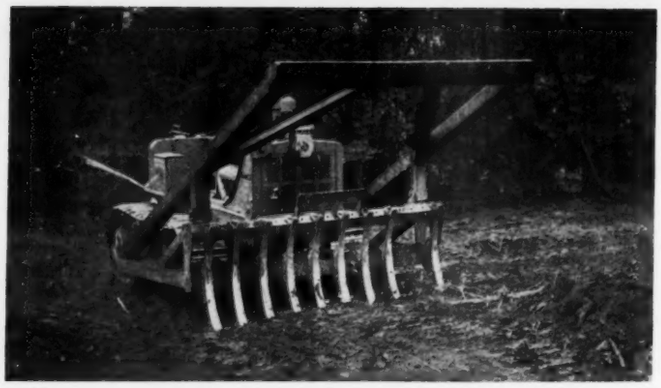
227 Lexington Ave. Homer City, Pa.



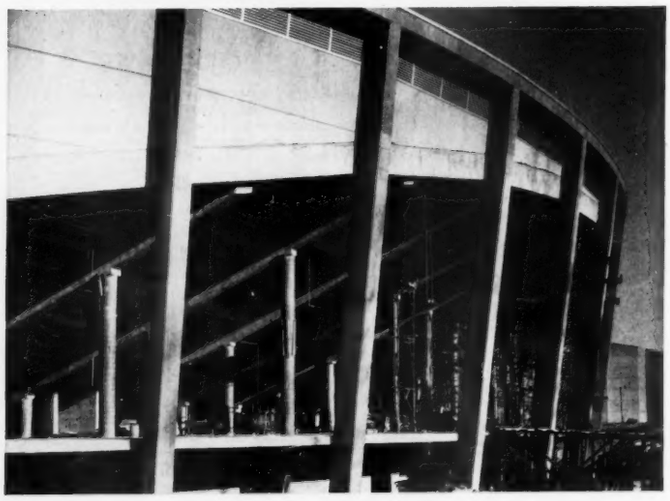
Rockland's new tree-knockdown boom is teamed with a Model RF-2 rake mounted on an Allis-Chalmers HD-20 tractor. As the tractor drives forward, the boom bends the tree trunk and the rake uproots it. Missing rake tooth shows that teeth are removable. For details circle No. 344 on card at page 18, or write to Rockland Allied Equipment Co., 3778 W. Colonial Drive, Orlando, Fla.

The Pettibone Cary-Lift can be equipped to handle a variety of loading tasks. The loader is available in four models: Fork, Swivel Clam, Sling, and Super Sling. One-yard and 4-yard slip-on buckets and scoop bottom-dump buckets are also available. For details circle No. 345 on card at page 18, or write to Pettibone-Mulliken Corp., 4700 W. Division St., Chicago, Ill.

SONOTUBE

FIBRE FORMS ®

for round columns of concrete . . .



Coliseum, Charlotte, N. C., A. G. Odell, Jr. and Associates, architects, Thompson and Street, contractors

Round columns speed the work . . . cut costs!

. . . low cost SONOTUBES® make it possible

In Charlotte's Coliseum, round columns formed with SONOTUBES were used as the supporting elements for the elevated floor and arena-type sloping seat-deck.

Varying heights of the columns, clearly visible in the photo, are obtained by merely sawing the fibre forms to required lengths on the job.

SONOTUBES save time, labor and money . . . easily handled because they require minimum bracing. Low cost SONOTUBE Fibre Forms provide a fast, economical method of forming round columns of concrete.

Approved by architects and engineers, widely used by contractors everywhere.

In 26 sizes, from 2" to 36" I.D. up to 50' long.

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Efficient ways to handle bulk calcium chloride

■ Recommended procedures for handling calcium chloride in bulk is the subject of a new booklet from Dow Chemical Co., Inorganic Chemicals Sales Dept., Midland, Mich. The booklet tells how to establish, operate, and expand facilities for bulk calcium-chloride operations. Bulk handling of this chemical is based on Dow's development of Peladow, a pellet form of calcium chloride.

The booklet deals with methods to be used when tank-cars or dump-truck loads of dry calcium chloride are to be made into liquid and stored. Techniques for unloading dry calcium-chloride pellets from railway or truck cars into elevated or semielevated storage tanks are also described. There is also a discussion of procedures and equipment involved in the spreading of both dry or liquid calcium chloride, and equipment and materials necessary for handling and storage.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 222.

Thew Shovel completes purchase of Byers firm

The Thew Shovel Co., Lorain, Ohio, has completed acquisition of the former Byers Machine Co., Ravenna, Ohio, for slightly more than $900,000. The plant will now be operated as a new subsidiary corporation, Byers Machine, Inc. Byers had produced crawler cranes, backfillers, shovels, and similar equipment.

A. C. Lundgren is president of the new organization, E. C. Brekelbaum and W. V. Clark are vice presidents, R. W. Gleason is secretary and treasurer, and Brooks Maccracken is assistant secretary. W. W. Blauvelt is general manager.

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HOBBS ENGINE HOUR METERS make it easy to plan a definite program of protective maintenance on your powered equipment. ON-TIME maintenance means longer equipment life . . . less down-time . . . fewer repairs — a more profitable operation in the long run.

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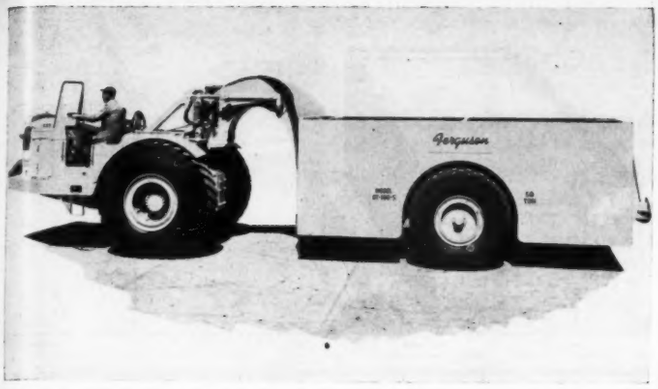
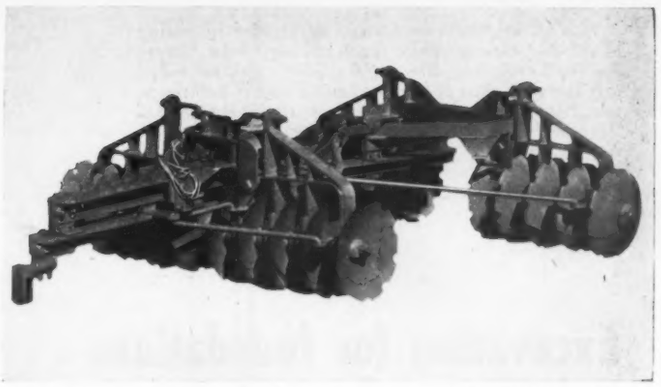


This compaction team consisting of a Ferguson 50-ton compactor and a Caterpillar DW21 tractor offers the advantages of multiple speeds, excess power, and the ability to turn sharply. Other Ferguson compactors are available with hitches to fit all two and four-wheel tractors. For details circle No. 346, on card at page 18, or write to Shovel Supply Co., 4900 Hines Blvd., Dallas, Texas.



The new Brushmaster dual tandem-harrow is recommended for disking and brush-cleaning work. The principal unit has twenty 26-inch cutout blades on 10½ inch spacings. The cutting width is 10½ feet. The detachable rear unit has ten 26-inch cutout blades and a cutting width of 8½ feet. For details circle No. 347 on card at page 18, or write to Alexander Mfg. Co., Picayune, Miss.

Curing agent in powder form can be applied on finished concrete slabs without delay

■ A new development of Reardon Industries, Inc., is a curing powder that can be applied over freshly poured concrete without the delay required by other concrete curing methods. Sprinkled by hand, Duscure powder forms a continuous film over the finished concrete instantly.

It is estimated that one workman can apply the curing agent faster than six men can finish concrete. A finisher may apply it as he completes troweling. Use of the powder-form curing compound eliminates the need for return trips to the job for adding water or for removing coverings.

The film coating that Duscure produces is white. Therefore, in addition to reducing water evaporation, it reflects much of the sun's rays. This improves the quality of the concrete by minimizing the difference in temperature between the surface and the bottom of the slab. The combination of instant moisture sealing and heat reflection also tends to increase the hardness of the concrete.

In addition, Duscure is reported to have some value in reducing the danger of freezing in the early stages of curing. Its quick-application feature makes it possible to protect fresh concrete from cold air sooner than is ordinarily feasible.

According to the manufacturer, the curing powder will not burn and gives off no fumes, making it particularly useful in or near occupied buildings.

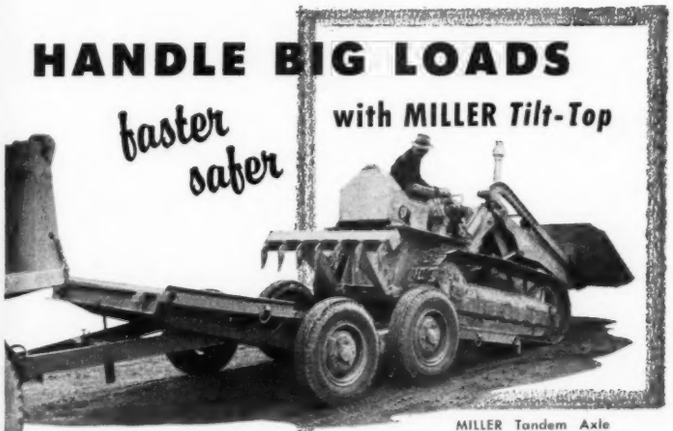
Duscure is available in 5 and 25-pound bags. One pound covers about 20 square feet of concrete surface.

For further information write to Reardon Industries, Inc., 2837 Stanton Ave., Cincinnati 6, Ohio, or use the Request Card at page 18. Circle No. 235.

HANDLE BIG LOADS

faster safer

with MILLER *Tilt-Top*



MILLER Tandem Axle
10 ton *Tilt-Top* Model "BT-10"

In the picture above ONE man is loading a big, heavily equipped D-4 by simply driving it onto the tilted platform of the tandem axle Model "BT-10" MILLER Tilt-Top. The entire loading operation takes less than TWO minutes. Big and broad, the oak decked platform provides plenty of room and an extra low climb angle for maximum operator and equipment safety. For faster, safer between-job hauling of dozers, rollers, and other heavy equipment, get a MILLER Tilt-Top . . . you'll find it pays for itself!

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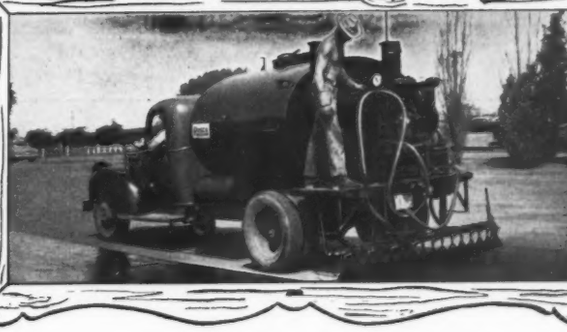
PICTURE OF A CONTRACTOR...

MAKING MONEY!



with a ROSCO

That's a photo of Francis Willette of the Willette Excavating Co. blacktopping the 8300 sq. yd. parking lot of the Dunwoody Institute in Minneapolis. His Rosco Model RHU Maintenance Distributor is making money on every job. Quick to start and get going, the RHU is designed for economical bituminous maintenance and limited construction. It has many of the features required by contractors . . . as well as municipalities. For driveways, alleys, streets, parking lots, shoulders, re-shaping curves, patching, sealing and a host of other jobs . . . Model RHU will get YOU "into the profit picture". Check the money-making features with your Rosco dealer. He'll show you what Model RHU can do for you. 800 to 1000 gallon capacity.

2-Wheel Model RMT Maintenance Unit with front mounted heaters and rear mounted pump and engine is available in 400, 500 or 600 gallon sizes.

ROSCO ASPHALT KETTLES

Used by contractors, highway departments, roofers and waterproofers for heating and melting all types of bituminous materials. Two-pass heating system, ruggedly built. Capacity 2, 3 or 4 barrels.

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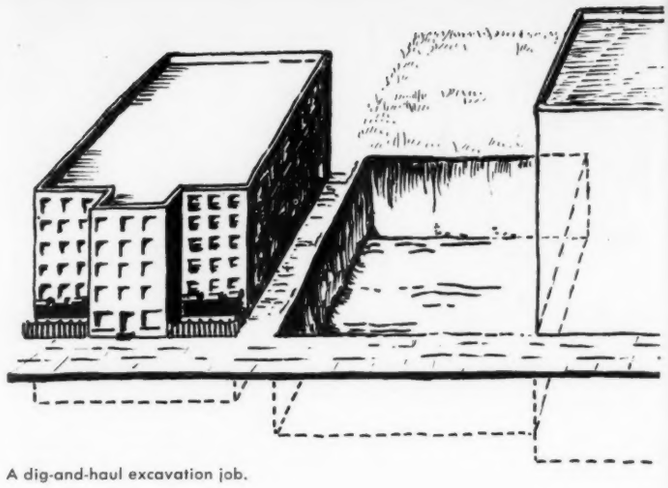
This is the fourth in a series of articles consisting of selected excerpts from the 1,280-page book, "Moving the Earth," by Herbert L. Nichols, Jr., published last March. Priced at $15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at $15 plus postage.

Excavating for foundations



A dig-and-haul excavation job.

In large commercial excavations of the dig-and-haul type, one of the most important considerations is arranging for the disposal of the spoil, except when it is to be used as fill on the same project. It may be possible to sell it profitably, or it might be necessary to pay someone for dumping it.

Disposal arrangements may not only determine the price to be charged for the digging, but also the time of starting the work and the number and type of excavating and hauling units to be used.

The distance to the dump may be much farther for the trucks than for a car because of restrictions on trucking on residential streets. An inspection should be made of the dumping site, and any price quoted for fill should contain provision for additional charges for dumping delays.

An excavation contract should specify that the owner, or general contractor, will be responsible for obtaining all permits necessary for the work. If the job is stopped because of failure to have such permits in order, the excavator should have the privilege of charging for the tied-up equipment on an hourly basis.

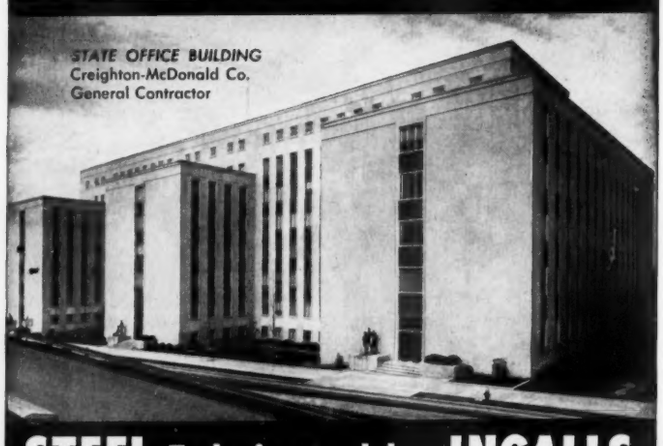
Machinery

If the excavation is large, the dipper-stick shovel is the preferred machine, unless the pit floor is too wet or sandy for trucks. The dipper is the fastest loading machine. It can cut walls and floors with reasonable accuracy, and it is not hampered by obstructions just outside the digging line, or by rough or steep ground surface.

When the excavation is small, wet, or sandy, a backhoe is better. Its smaller output is more than compensated for by accurately cut edges, truck loading on top, and ability to work without a ramp. If the hole is to be very deep, a clamshell will be most satisfactory.

In most cases, the dipper shovel cuts a ramp down, inside the digging

IN NASHVILLE, TENN.



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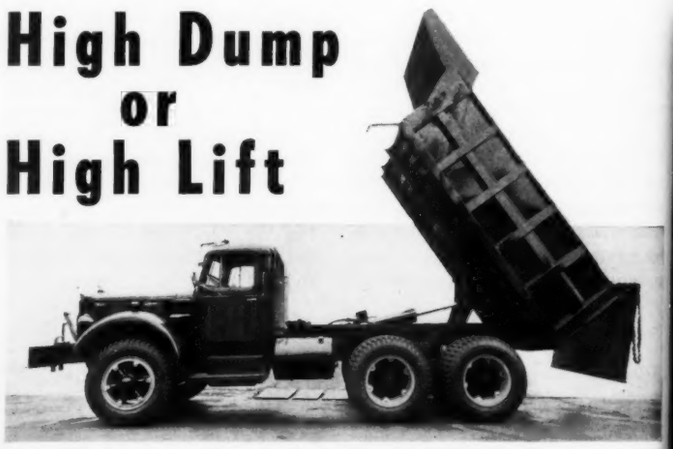
High Dump or High Lift



CRESCI has the right body and the right hoist

Here is a new heavy duty dump body that can really take it. The fully welded body has a one piece hi-tensile steel floor, and the double arm roller-type hoist allows a 60 degree dumping angle.

This Cresci body has outside controls for greater safety and easier spreading. The closed tracks prevent tipping, and eliminate the danger of pulling the head out of the cylinder if the tailgate fails to open.

No retarding or pull-back chains are necessary. Every Cresci body carries a full year factory guarantee.

High Lift Lumber Body

Write for further details on the whole Cresci line of bodies and hoists.

A. Cresci & Son, Inc.
VINELAND, NEW JERSEY

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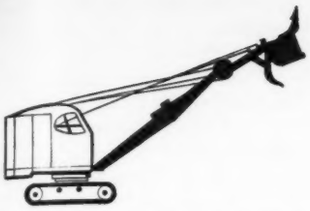


lines, which must be of such grade and material that loaded trucks can climb it. The grade may be between 1 to 5 and 1 to 12, depending on the power of the trucks and the loads placed on them. The slope is made as gentle as the length and depth of the hole permit, so that larger loads may be carried and breakdowns reduced.

If the plot is sloped, the ramp should be cut in from the lowest point on the edge to which trucks have access.

Timber ramps afford less tractive resistance and better footing than earth, and so can be built with a steeper slope. They can be left in place during construction of the foundation for convenience in moving building material. However, timber work is so expensive that these ramps are largely limited to use in excavations that are very deep in proportion to their length and width.

The shovel may dig the floor of the pit exactly to grade, or may dig portions of it below grade to allow room for disposal of spoil from hand-dug trenches.

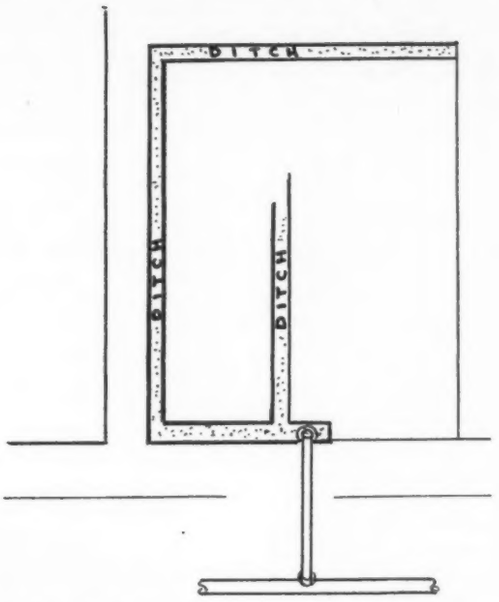
Sometimes the whole excavation is dug to the bottom of the footings or piers, and sufficient spoil piled just outside the excavation to refill to pit floor grade. A clamshell may be used to put the dirt back in the hole, and a bulldozer to spread it. A small bulldozer can be lifted in and out by the clamshell.

Moving in

Arrangements should be made to prohibit parking directly in front of the work area before machinery is brought in.

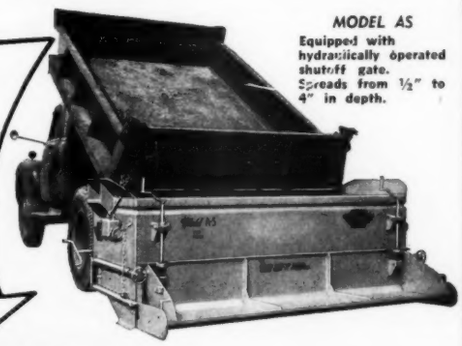
The shovel is unloaded from the trailer onto planks laid on the street to protect the pavement, or directly onto the sidewalk which is not protected because the trucking will destroy it anyhow. Digging is begun in the sidewalk, or at its rear edge, and sloped down at about a 1 to 5 (20 per cent) grade in a cut 30 to 40 feet wide. Trucks are first loaded when standing in the street, parallel to the curb. As the digging progresses, they are backed across the sidewalk and down the ramp.

It is necessary to have one man, preferably two, assigned to preven-



One method of lowering the water table in and around an excavation consists of ditching on three sides and in the center of the pit, allowing water to drain through a pipe to the storm sewer in the street.

Let us prove to you how...



MODEL AS
Equipped with hydraulically operated shut-off gate. Spreads from ½" to 4" in depth.

HI-WAY SPREADERS SPEED SEAL COATING OPERATIONS

4 MODELS TO MEET ALL REQUIREMENTS! NEW FEATURES YOU'VE BEEN LOOKING FOR!

HI-WAY Spreaders—with their exclusive combination of engineering features—help you do those *Seal Coating* jobs faster . . . Better! Before you make any Spreader purchase, *be sure* you have the facts on these features of HI-WAY Spreaders.

- Forward and Reverse spreading
- Adjustable width spreads
- Volume controlled by feedgate
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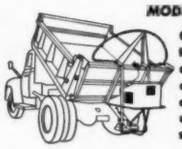
- Quickly attached and detached
- No controls to install in truck cab
- Interchangeability with different dump bodies



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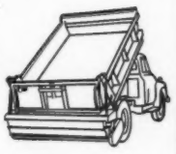
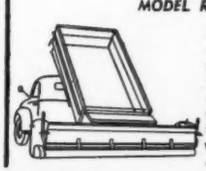
MODEL J
Enables you to work close to buildings, driveways, narrow alleys, etc.



MODEL R
Spreads forward or reverse with control of material flow. Has worldwide acceptance.



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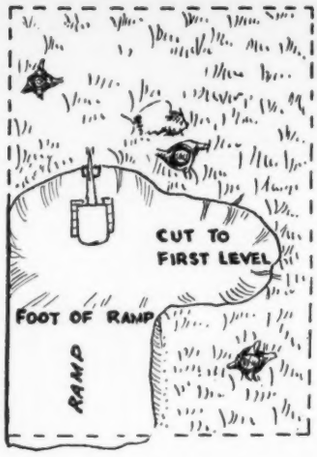

Dipper shovel cutting ramp and first level in large excavation job. The side cut to the right of the shovel provides space for haul trucks to turn around in the pit.

tion of tangles between traffic and trucks. These should be policemen, or contractor's employees authorized by the police to do this work.

Trucks should be backed into both sides of the ramp, and faced directly away from the shovel while being loaded. At least one truck should always be in loading position.

A bulldozer may be used to advantage to dress up the ramp and keep the pit floor smooth, and may be useful to push weak or overloaded trucks up the ramp. The smallest bulldozer can handle the grading work, but a medium or large one would be needed for effective truck pushing.

Trucks with 4 to 8-yard capacity are well matched to a ¾-yard shovel, but anything from 3 to 12-yard-capacity can be used. Small ones can maneuver more easily and work well on certain types of soft ground. Large ones cause less traffic congestion, and under favorable conditions will move soil at lower cost. If the pit is wet or sandy, all-wheel-drive machines are preferable. Trucks must be in good condition to carry capacity loads up the ramp.

Barricades

As digging approaches the sidewalk, barricades must be erected to keep spectators from climbing or falling into the pit, and from using any part of the sidewalk likely to cave in. These barricades may be solid wood fences, or may be perforated so that "sidewalk superintendents" may watch the work. The contractor may be able to build up local good will by encouraging spectators.

Furnishing adequate windows or peep holes reduces the dangerous practice of spectators standing in the truck driveways to watch the work.

An external factor which may limit the number and size of shovels in such an excavation is traffic congestion on the street. This may create a bottleneck that will leave a line of empty trucks parked waiting in the street, with the shovels half idle for lack of trucks to load. In congested areas, traffic may be one of the principal problems in the digging operation.

The trucks carrying the spoil from the hoe may be loaded sideward to the shovel for safety, or from the back for convenience. If the body sides are very high, loading will be inconvenient and spillage excessive. This difficulty may be reduced by loading directly behind the shovel so that it will have to walk over the spilled material, which will raise it so that loading will be easier. This spillage needs some manipulation to make a smooth ramp, particularly if the soil contains boulders.

Another method of loading trucks easily is to start the cut at the sidewalk, making a ramp wide enough so that a truck can be backed against one part of the face to be loaded, while the hoe digs beside it.

The hoe will move from 10 to 30 per cent less dirt per hour than a dipper of the same size—a loss which may be only partly compensated for by the straight wall cuts and the fact that the ramp may be removed without calling in another shovel or rig. However, if certain difficulties develop, the pull-shovel output will be unaffected, while that of the dipper will be sharply reduced, and the presence of the hoe is insurance against undue loss of time from such causes.

Ground water

The most common difficulty in excavating is ground water. It may be in the form of springs or underground streams, or a nearly stagnant water table with capillary water moistening the soil for several feet above it. Wet soils usually turn to mud when loaded or disturbed, and impede or bog down trucks.

If the first level should have a firm floor, but water be encountered in the next layer, trucks would not be able to operate on the bottom without expensive aids. Thus, removal of this bottom layer with a dipper stick would be impractical. The hoe would not be bothered unless there were sufficient water to hide the bottom, in which case it would have to be pumped out.

Information about underground conditions may be obtained from test borings or pits on the site, from people who have dug cellars or ditches in the neighborhood, and from geolo-

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gists. Such data may predict with reasonable accuracy the depth at which mud, water, loose sand, or rock might be expected.

Special conditions may require taking off the ground in three cuts, or in one. The pattern should be such that the maximum amount of dirt will be dug by dipper sticks, on floors which permit trucking. When thin cuts are made the dipper can load trucks standing on the upper level, but the extra dumping height slows the digging, and in some materials the bank is not stable enough to support trucks.

Under wet or sandy conditions the bulk of the digging may be done by a dragline. If the soil is soft, a ¾-yard machine might possibly cut to an 18-foot depth, but for firm or hard soils, a very large machine would be required. The efficiency of a dragline can be greatly increased by ditching two walls with a hoe or a clam, and working the drag back from these edges to reduce the amount of trimming required.

Mud can be dried by draining or pumping the water. If the storm water drain in the street is sufficiently low, arrangements should be made to connect with it before excavating. A ditch is dug from the pipeline in the street to a spot several feet inside the excavation area, and a pipe with sealed joints laid, opening into the storm drain. At the cellar end, a vertical pipe of tile or concrete sections with unmortared joints, or a perforated pipe, is erected. Sand or clean gravel is placed around the vertical pipe as the trench is backfilled, or a wooden barrier is placed to prevent backfill from closing the hole around it.

Each floor made during the digging should be sloped to drain to this pipe, which can be opened at any level.

This installation will also serve to remove some ground water from the site before excavation.

Wellpoints

A satisfactory but expensive way of pre-draining the area is to use wellpoints. Points may be driven outside of the digging line on two sides, and perhaps, by special permission, in the sidewalk.

Digging may be done without predraining, and water pumped out of the hole as it appears. If the water is very dirty, and quantities are small or moderate, a diaphragm pump should be used. If the inflow exceeds the capacity of a diaphragm—about 1,500 to 3,000 gph—several may be used. More often in holes of this size, centrifugal pumps are employed. Best results will be obtained by locating centrifugal pumps as close to the water level as possible, as their push is more efficient than their pull. Holes should be dug so that the inlet will be a foot or more below the water surface. Sucking air in shallow water may be reduced by floating a piece of board over the inlet, where it will block the formation of whirlpools which would conduct air down to the inlet center, or by arranging the hose so that it rises vertically out of the water.

Caving of banks and undermining of adjacent structures must be guarded against, particularly in connection with pumping. Caving banks involve hazards to men and equipment and to adjoining structures, and increase the amount of excavation and backfill necessary.

Some materials, such as dry sand, will not stand in vertical walls. Here digging must be figured to include natural slopes from the foundation line outward to the surface, or provision made to drive sheeting or erect other barriers to hold it from sliding. Sands or sandy soils containing the right amount of moisture will stand vertically, but they cannot be trusted, as drying will result in surface disintegration and sliding. Heavy rainfall, too, may increase their weight and undermine them by washing grains out at the bottom so that massive caving will follow.

Silts, clays, and loams usually stand well if not too wet, but if resting on a saturated layer draining into the excavation, they may be undermined so as to fall. Vibration of machinery or street traffic may cause clay to creep or flow.

Gravel may stand or may slide, depending on the shape and grading of the coarse particles, presence of cementing material, and the amount of fines. Angular gravel of several sizes, with just enough fines to stick it together, will stand wet or dry unless subject to excessive water flow or wave action. Very clean gravel, particularly if it includes a large proportion of cobbles and rounded pebbles, may slide in much the manner of dry sand.

Often the most serious aspect of removing water from an excavation is the effect on adjoining property. Water makes up a substantial part of the bulk of some soils, and removing it, together with any soil it carries, sometimes causes shrinkage, with settlement of the surface and overlying structures. Damage to structures may also be caused by creeping of plastic soils beneath them.

Shoring

Movements of soil into the pit can practically be stopped and water intake reduced by the use of timber bulkheads or sheet piling. These are required by law in many cities, and

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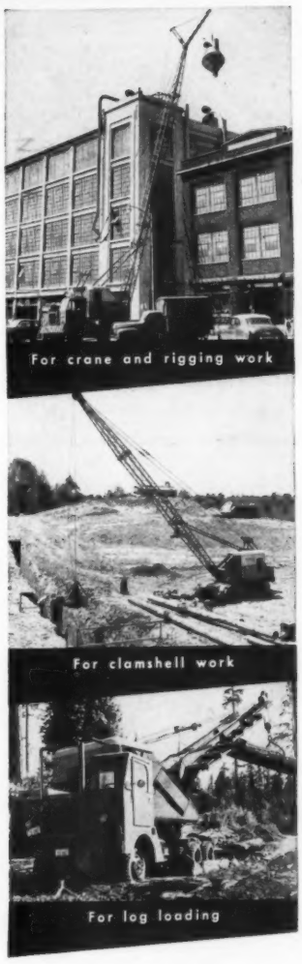

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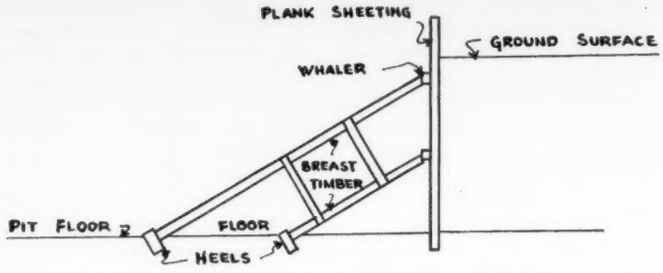


Temporary bracing of pit face in soft excavation work.

(Continued from preceding page)

are often good (although expensive) insurance against costly repairs and underpinning.

Installing such bulkheads is a highly technical operation, involving knowledge of soil behavior, engineering calculations, and skilled personnel.

When dry excavation is carried a considerable distance below the water table without dewatering the area, the heavy walls constructed to keep out soil and water are called cofferdams. The bracing structures already described can be included in this term.

Cofferdams consisting of a single row of interlocked steel piling, with interior bracing, have been used for depths up to 60 feet, although ordinary practice limits them to 40. They may be installed by hammering the piling in undisturbed ground until it reaches bedrock, or to sufficient depth below the excavation floor to be considered safe. All the sections should be placed and driven to moderate depth before any of them are driven all the way, to make sure that all points interlock properly.

Excavation in this case is likely to be done by clamshells. Bracing is placed against the inside of the wall as it becomes exposed.

If the soil is very porous, great difficulty may be experienced getting the water down the first few feet, as the joints between sections tend to leak until forced together by water pressure. More or larger pumps may be used at this stage of the job. It may be necessary to trench outside the wall to place a clay seal part way down, or to partially seal the soil with cement grout.

The double-wall cofferdam is a more elaborate structure which provides means both to combat the problems encountered and to work at greater depths. Two rows of steel interlock piling are driven. The space between them may be excavated wet, and the bottom concreted to form a good seal against a rock bottom and to protect the ends of the piles from being bent in a blow-in by water pressure. The walls may or may not be cross braced to each other. They are filled to the top with clay or other soil.

Caissons

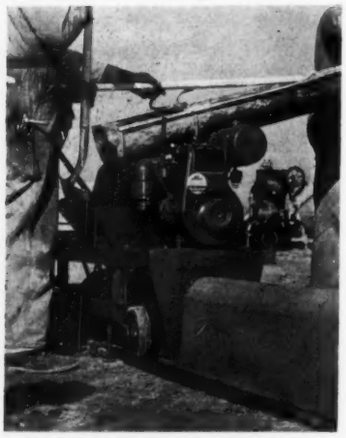
A caisson is a structure which serves to keep soil and water out of an excavation, and forms part of the permanent structure for which the excavation is made.

The caisson is lowered by digging inside to undermine it and building the top to provide more weight and to keep it above ground or water as it descends. Most of the digging is done under water, and it is a very ticklish job to do it accurately enough so that the caisson will sink straight. When it comes to the bottom, investigation must be made to determine whether it is on bedrock or boulders. If the rock surface slopes, concrete must be pumped underneath to give it firm bearing on the low side.

The pneumatic caisson has an air-tight cap over the bottom, with sufficient air pressure maintained under it to keep water out. Air locks and chambers are provided for entrance and exit of men and material. Much of the digging is done by hand, and in deep work at high pressures, men may be limited to less than an hour of work at a stretch, with long periods spent in entering and leaving the high-pressure work chamber. Depths up to 100 or 110 feet can be reached.

Pneumatic caisson excavation is extremely expensive, but it is more positive in results than the open-top

The Stephens-Canfield Automatic Curber



Three men are required to operate the machine, which may be run on an angle-iron track or directly on the ground. Material fed into the hopper is extruded through worm gear into the curb mold under high pressure. The compacted pressure moves the curber forward leaving a finished curb behind. No hand finishing is required, and traffic can be turned on the following day.

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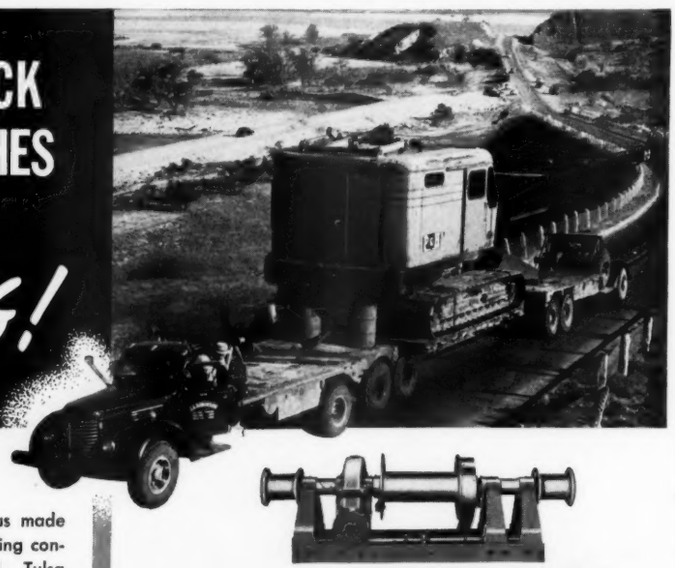

Movement of this power shovel was made easily and quickly by a Texas trucking contractor with two truck-mounted Tulsa Winches. This is just another example of the versatility and reliability of Tulsa Winch. There is a Tulsa Winch for every make and model of truck and crawler tractor.

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method. It is the only practical procedure in ground which is very irregular in structure, or which contains boulders, tree trunks, or old piling.

Rock

If bedrock is encountered that is too hard for the shovel to tear apart, it must be blasted. Generally it is best to complete the earth excavation first, to reveal the full extent and as much of the grain and quality of the rock as possible.

Sometimes, however, drilling and blasting are started as soon as the rock is found, and the shovel doing the earth excavation is utilized for handling logs or blasting mats. This may save shovel time, as under city conditions it is not often practical to to blast rock fast enough to keep a shovel busy. Thus a shovel whose only duties are handling mats and removing blasted rock is likely to be idle most of the time. On the other hand, earth-hauling trucks will be stopped while the shovel places mats and during blasting.

Hoe shovels and small dozers are good machines for cleaning the bulk of earth off ledges, but there is almost always need for hand work also.

The presence of boulders slows digging. If they are numerous and of such size that they must be lifted individually by chains or broken up before handling, they may be more expensive to dig than a uniform mass of bedrock.

Clamshell, and more particularly orange peel buckets, handle boulders up to the lifting capacity of the shovel very readily. If they are not available, chains, cables, or slings may be used for stones too large or misshapen to be handled by a dipper or hoe bucket.

Chains should be of the lightest size that will lift the weight, as a thin chain grips rock much more closely than a thick one. Undersize chains break frequently, and spares and repair links and hooks should be kept on hand. Alloy chains are expensive but are small and light in proportion to strength. Small cables grip rock well but wear and fray rapidly, so that sharp ends of broken wires make them dangerous to handle.

(To be continued next month)

New scaffolding catalogs

■ Two new catalogs describing its steel scaffolding and maintenance trestle lines have been issued by Bil-Jax, Inc., Archbold, Ohio.

Catalog ST-10 illustrates a wide variety of tubular sectional scaffolding, including such allied equipment as casters and base plates, putlogs, shoring equipment, side brackets, rolling towers, metal catwalks, material hoist towers, concrete equipment, etc.

Catalog MT-20 shows the company's maintenance trestles including, also, rolling safety ladders, window platforms, lean-to ladders, ladder jacks, and other items.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 232.

Machine cuts grooves in open-grid bridge flooring

■ A surfacing machine that cuts small grooves in the surface of existing open-grid bridge flooring is described in a booklet from Reliance Steel Products Co., Walnut St., McKeesport, Pa. The grooves made by the Safe-Grip machine are said to be effective in preventing skidding on this type of bridge deck during wet weather.

The Reliance machine is self-propelled and allows highway engineers to maintain one-way traffic while it is in use.

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FACTS ON FINANCE

by WILLIAM HURD HILLYER

Capital assets and savings are drifting steadily into the stock market, income-producing property is being mortgaged, and bonds of unquestioned safety are being liquidated, according to financial authorities, to provide equity dollars. For heavy construction this means a depletion of investment reserves from which public and private improvement projects draw their funds.

The Federal Reserve banks eased the short-time money situation last month by purchasing government bonds and the relaxing reserve requirements, thus pouring fresh cash into the financial system.

The bond mart, already described as "heavy" in spots, has begun to show some evidence of price cutting. State and municipal offerings through June amounted to over $326 million, and the weekly average of long-term marketing has been around $100 million. With relatively tight money a fall possibility, and with member banks borrowing hundreds of millions from the Federal Reserve System to finance a billion-dollar increase in loans to brokers over 1954, sober observers feel that until the stock situation is better stabilized, municipal and other public improvement bond money may be in short supply.

The "revenue" idea in public financing—a principle which is branching out to tap new fund reservoirs for construction purposes—is a more encouraging aspect of the bond market. This is the idea behind the quickly subscribed 5 per cent First Mortgage Industrial Development Revenue Bonds of the City of Florence, Ala. Carrying the successful toll-road financing principle a bit further, these bonds are exempt from federal income taxes, in the opinion of counsel, and are secured by trust indenture on industrial construction. These bonds at par yield the equivalent of 7½ per cent to the average investor in a 30 per cent tax bracket.

Tollway financing has received further impetus by the mid-June marketing of $74 million in Florida State turnpike 3¼ per cent revenue bonds at par—the first sale in 1955 by a turnpike authority raising its own initial money.

Aiding factory construction are tax-free issues by county industrial authorities, comparable to securities issued by school, housing, and redevelopment bodies. Such bonds are favored by the retiring president of the Pennsylvania Banker's Association as a "free enterprise" substitute for an "attract business" program financed with state funds. Though modest as yet, projects like this indicate that state, county, and municipal money-raising machinery is edging toward a "pay-your-way" basis.

The slight degree of uncertainty about the current dependability of the bond market comes at a time when the reported cumulative 1955 dollar volume is 42 per cent above a year ago and 19 per cent ahead of the previous record in 1953. This brilliant showing, and the increasing confidence of bankers in construction, is expected to put bank loans to the industry at a record level during the fall, to counter the drop in available funds from other sources. This expectation was revealed in a poll of 163 leading banking institutions which account for one-third of the country's bond loans to business. The increase in loans is estimated to run from 5 to 10 per cent, though a sizable proportion of executives feel the rise should be nearer 25 per cent.

Confidence in business as a whole, as well as in construction, is being expressed by banking institutions. The Ford labor peace, which made optimism run higher, was promptly reflected in a record-breaking stock market. Such signs as a lessening demand for machine tools, and a falling off in new orders and shipments are not considered dangerous in the light of these economic developments:

1. Bank clearings are maintaining their lead over last year. An average rise of 4 per cent brings the weekly total in 345 reporting cities to $160 billion during the first four months of the year. But New York City is off nearly 1 per cent for the period.

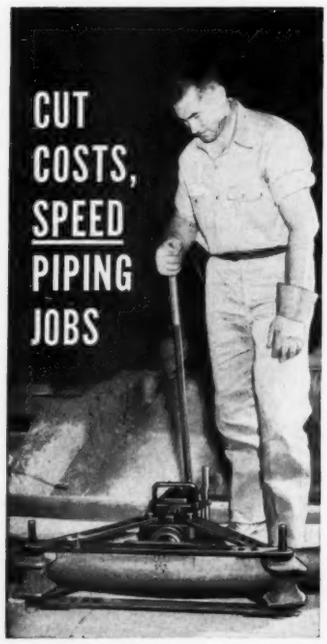
2. Steel production is about 25 points higher than last year, relative to capacity.

3. Total industrial output is remaining steady, while freight carloadings have shown a 13 per cent increase over a year ago.

4. Business failures are declining and new corporations increasing. Failures are 123 less than last year, and new concerns have increased by 28 per cent.

5. Personal income hit an all-time high of $295 billion, at an annual rate, for the first four months of the year.

6. Gross private investment is increasing at a rate officially estimated at $10 billion. THE END



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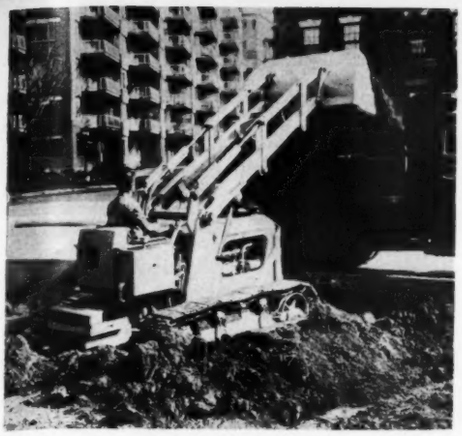
Anthes FORCE OILER CO.
Fort Madison, Iowa



The Oliver OC-12 crawler tractor with the new Model 12 WI loader.

New 1 1/4-yard bucket loader for crawler tractor

■ A new front-end loader—its OC-12 crawler tractor—has been announced by The Oliver Corp., 400 W. Madison St., Chicago 6, Ill. The loader features exceptionally wide control that permits digging to a depth of 30½ inches below ground surface and raising to a maximum height of 12 feet 8 inches. Capacity of the Model 12 WI loader is 1¼ yards.

The bucket on this loader has a rollback of 37 degrees, which makes it easier for the attachment to take big bites and to carry heaping loads with less spilling. Since the extra rollback also allows loads to be carried closer to the tractor, less ballast is required to counterbalance the tractor.

The discharge angle is 57 degrees. Maximum dumping height at bucket hinge pin is 10 feet 4 inches.

The OC-12 tractor is available with gasoline or diesel engines supplying the unit with 45.1 and 44.3 drawbar horsepower respectively. Both feature a wide torque span to provide dependable lugging under all conditions.

The tractor-loader model has a long track frame that provides extra stability and balance and, also, ripple grousers. The unit is equipped with Oliver differential steering that keeps power on both tracks at all times.

For further information write to the company, or use the Request Card at page 18. Circle No. 276.

Hydraulic highway mower passes over obstructions

■ A hydraulic mower that is easily attached to any standard tractor is illustrated in literature from Triumph Machinery Co., Box 110, Hackettstown, N. J. The Hydro-Clipper mower features single-lever control of the cutter bar. In addition, the cutter bar breaks back 90 degrees to pass obstructions, and then automatically returns to cutting position. The full-floating mower follows the ground level through a 135-degree operating range adjustment.

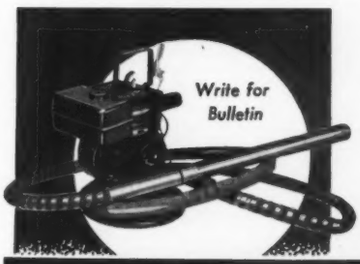
Having no chains, universals, or cables, the Hydro-Clipper is said to require very little maintenance.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 293.

Army engineer officers get new assignments

Col. M. P. Barschdorf has been assigned by the U. S. Army Corps of Engineers to the post of secretary and assistant division engineer of the lower Mississippi Valley Division of the Mississippi River Commission. He succeeds Col. Charles F. Mitchim who has been transferred to SHAPE.

Brig. Gen. Benjamin B. Talley, North Atlantic Division Engineer at New York City has been assigned to the headquarters of the Mediterranean Division, Nouasseur, French Morroco.



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Rugged Construction Work Demands MECHANICS Stamina

There is a size and type MECHANICS Roller Bearing UNIVERSAL JOINT for every construction equipment application. From 200 to 50,000 pounds foot torque — with a wide variety of end fittings and shaft arrangements — for both drive lines and steering columns — MECHANICS JOINTS "measure up" in the toughest service. Let MECHANICS engineers help solve *your* heavy-duty universal joint problems.

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UNIVERSAL JOINTS
For Cars • Trucks • Tractors • Farm Implements • Road Machinery • Aircraft • Tanks • Busses and Industrial Equipment

Riding on pneumatic tires and having the maneuverability provided by a turntable mounting, this new DeKalb trailer is recommended for use as an on-the-job field office or tool shed. ►

write for further information
Swenson Spreader & Mfg. Co.
Lindenwood, Illinois

Speed Sealcoating Jobs with SWENSON SPREADERS

Trailer unit designed as portable field office

■ A new four-wheel-trailer unit designed for use as an engineering field office has been placed in production by DeKalb Commercial Body Corp., W. Garden St., DeKalb, Ill. Available in either 14 or 16-foot-long models, it is also suitable as a tool shed.

The Model 14, the smaller of the two, is 193½ inches long, 89 inches wide, and 78 inches high. The Model 16 measures 217½ × 89 × 78 inches.

Of fireproof construction, the trailer has a seamless tubular-steel frame, and arc-welded galvanized and annealed exterior panels. Heavy rib rails are placed at the floor level.

For further information write to the company, or use the Request Card at page 18. Circle No. 223.

Structural bolting compared to riveting

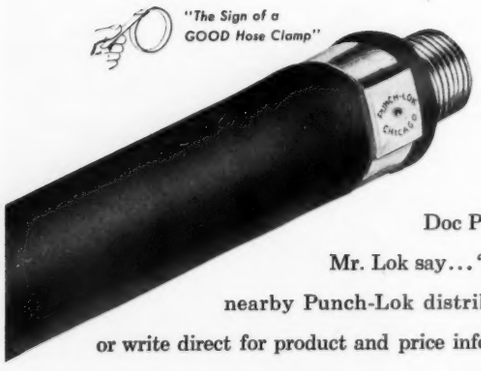
■ Some of the advantages of structural bolting over riveting are listed in a folder from Automatic Nut Co., Inc., Lebanon, Pa. This concern manufactures structural rib bolts and Anco-nuts, which together offer a practical substitute for riveting.

Requiring less equipment and manpower than riveting, bolting permits the contractor to erect two or three beams instead of scheduling work on an entire floor at one time. Rib bolting requires two men. Furthermore, fewer bolts will carry the same load, according to the literature, resulting in savings in gusset plates, connection angles, and other details.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 320.

Charm your hose

with PUNCH-LOK Hose Clamps



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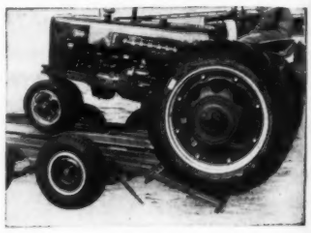
Slope Meters Mean *Efficiency Plus* on Your Tractors, Dozers & Graders

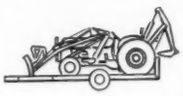
Slope Meter installed on your earthmoving equipment increases working efficiency by telling the operator, automatically, the exact crown or slope on which he is working. Slope Meters cut construction costs on highways, airports, dams, and building sites.

Order from your Equipment Distributor today or from THE SLOPE METER CO. EXCELSIOR, MINN.

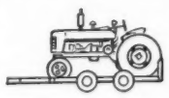
HAULETTE

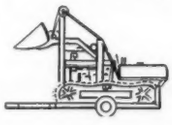
America's Most Advanced Tractor Trailer





QUICKER LOADING FASTER and SAFER HAULING





EASIER TO GET YOUR EQUIPMENT ON THE JOB

It is only natural that Fayette, leading designers and manufacturers of trailer undercarriage assemblies, should engineer the finest trailer for easier and safer transport of tractors and tractor equipment. This being made possible by the patented features of the famous Fayette undercarriage design.

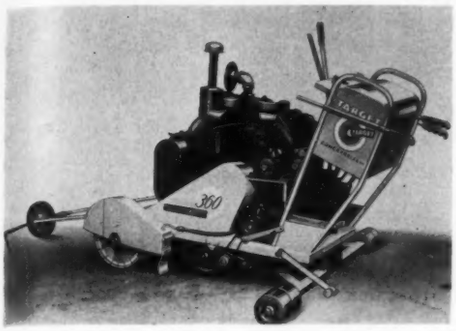
With Haulette you can quickly and safely haul equipment out in the field for contract work, picking up tractors for service using a light pickup truck.

Because you increase your efficiency with Haulette, it soon pays for itself in time saved and better service.

WRITE TODAY *FOR COMPLETE SPECIFICATIONS AND PERFORMANCE DATA.*

FAYETTE MANUFACTURING CO.
400 FIRST ST., FAYETTE, OHIO

Self-propelled concrete saw features increased power, control, and stability



A 36-hp engine drives the new Target Model 360 self-propelled concrete-cutting saw. Note outrigger-type rear axle designed to keep the machine cutting in a straight line.

■ To take advantage of the development of new faster-cutting concrete blades, Robert G. Evans Co., is marketing a new concrete saw powered by a 36-hp 4-cylinder engine. The self-propelled Target automatic Model 360, reported to be the most powerful concrete saw now available, also has improved operating features.

Forward speed can be varied from 1 to 25 feet per minute through fingertip controls. Furthermore, the operator can adjust the speed at which the blade cuts while the saw is in motion.

Hydraulic pressure feeds the blade into the concrete at a controlled speed. It also lifts the blade out of the cut in a single sweep.

Blade depth can be adjusted while the saw is in motion. A revolving pointer with an indicator for 12, 14, and 18-inch blades makes a visible record of the sawing depth.

With six solid wheels on the ground, and with a new outrigger-type rear axle, the Model 360 holds the blade straight on the cutting line. The widely-spaced wheels on the new axle bridge over uneven surfaces and resist side drift when cutting on slopes. A water pump flushes sludge out of the cut.

For further information write to Robert G. Evans Co., 7204 Wyandotte, Kansas City, Mo., or use the Request Card that is bound in at page 18. Circle No. 256.

Automatic batch plants have new design features

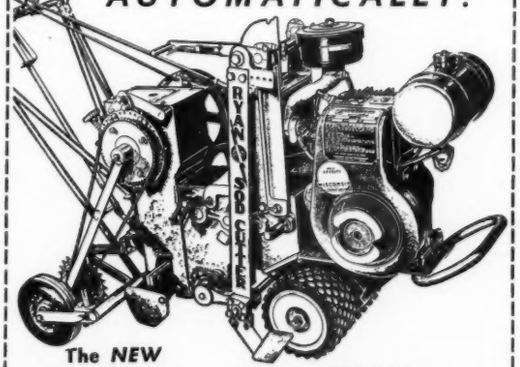
■ A new folder illustrates the basic principles of Barber-Greene's Model 890 Series BatchOmatic batch plants.

The BatchOmatics operate on new principles for aggregate and asphalt measuring. They are also unique in design of the pugmill, and are designed for fully automatic operation with manual operation as an option.

A discussion of the automatic operation of the plants tells how they may be switched instantly to manual operation and then back to automatic operation. The plants then automatically resume their repetitive cycle of operation.

To obtain Bulletin 890 write to the Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 348.

measures and cuts sod to exact length
AUTOMATICALLY!



The NEW Ryan Auto-Cut-Off Model
POWER SOD CUTTER
cuts 15 sq. yds. of sod per minute
(and cross cuts in the same operation!)

Here is, beyond doubt, the finest sod cutter ever built. The new Auto-Cut-Off model completely eliminates hand cross-cutting, gives you better quality sod with precision, square-cut ends for easier laying—greater profits. Easily cuts 15 sq. yds. a minute. Available in several sizes. For complete information, write Dept. K-1.

Ryan landscaping equipment company
Quality Built
Division of FMC Machine Works, Inc.
871 Edgerton St.
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WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

Write us for name of your nearest distributor.

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P. O. Box 1198 Terre Haute, Indiana

Doing It the Easy Way with SIMPLEX JACKS...

PRESTRESSING CONCRETE SLAB with a Simplex Re-Mo-Trol 30-ton hydraulic puller. When cured, 26' x 38' slab will be raised to form third story floor of school building. Intervening floors will then be cast, prestressed and raised into position. Only Re-Mo-Trol gives straight-line pull to prestressing wires through unique "center-hole", eliminates need for complicated back-up devices. Also has many uses as a powerful lifting jack on construction jobs.

15-TONS OF LIFT on either the cap or toe of this Simplex Model 24A jack is a feature that construction men like. Full capacity toe lets them lift from minimum clearances, cuts wedging and blocking necessary. Jack is ratchet lowering lever type; raises or lowers notch-by-notch—can't be tripped. 13" of lift.

TIMBER "STRETCHER" speeds shoring on foundation and tunneling work. Simplex Shoring Jacks, available in 25-ton or 35-ton sizes, are faster and safer than old-fashioned saw and wedge methods.

WHEN YOU'RE DOWN A HOLE you can feel safe with these Simplex Trench Braces on the job. Made entirely of drop forged steel. Easy to adjust, grip at any angle, can be nailed to timber for slip-proof safety. For any width trench.

SIMPLEX CONSTRUCTION JACKS are fully described in General Catalog 53. Write for a free copy.

WORLD'S LARGEST MFGRS OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS
SIMPLEX JACKS

TEMPLETON, KENLY & CO.
2511 Gardner Road • Broadview, Illinois

Powered wheelbarrow with 3/4-ton capacity designed to go up narrow ramps

Rated to carry ¾ ton of material or up to 16 cubic feet heaped, this new Prime-Mover powered wheelbarrow is compact enough to go up narrow ramps on which hand carts are normally used.

■ A new Prime-Mover powered wheelbarrow hauls ¾ ton on a chassis only 64 inches long and 31½ inches wide. Designed to go up narrow ramps, runways, hoists, and towers on which hand carts are normally used, the machine is also equipped with controls that allow an inexperienced laborer to operate it safely.

The ability of the new Prime-Mover unit to maneuver large loads in close quarters, over rough ground, up steep grades, and through narrow openings is expected to eliminate much in-between handling of materials on construction jobs. The equipment features a quick method of changeover from dump bucket to flat-bed with the beds latching in place.

The dump bucket, which has rounded corners, hauls 10 cubic feet measured level and up to 16 cubic feet heaped. Two sizes of flat-beds adapt the new Prime-Mover for carrying solid building materials.

Standard equipment includes engine, forward and reverse transmission, recoil starter, and large fuel tank. Sealed-in lubrication and a one-piece engine hood minimize and simplify maintenance.

The manufacturer reports that in field tests conducted on construction jobs, the powered wheelbarrow has placed from 12 to 17 cubic yards of concrete per hour, carried up to 300 bricks each trip, and hauled 1,500 pounds of glazed tile up a 20 per cent grade.

For further information write to Prime-Mover Co., Muscatine, Iowa, or use the Request Card at page 18. Circle No. 251.

Lightweight hand hoist

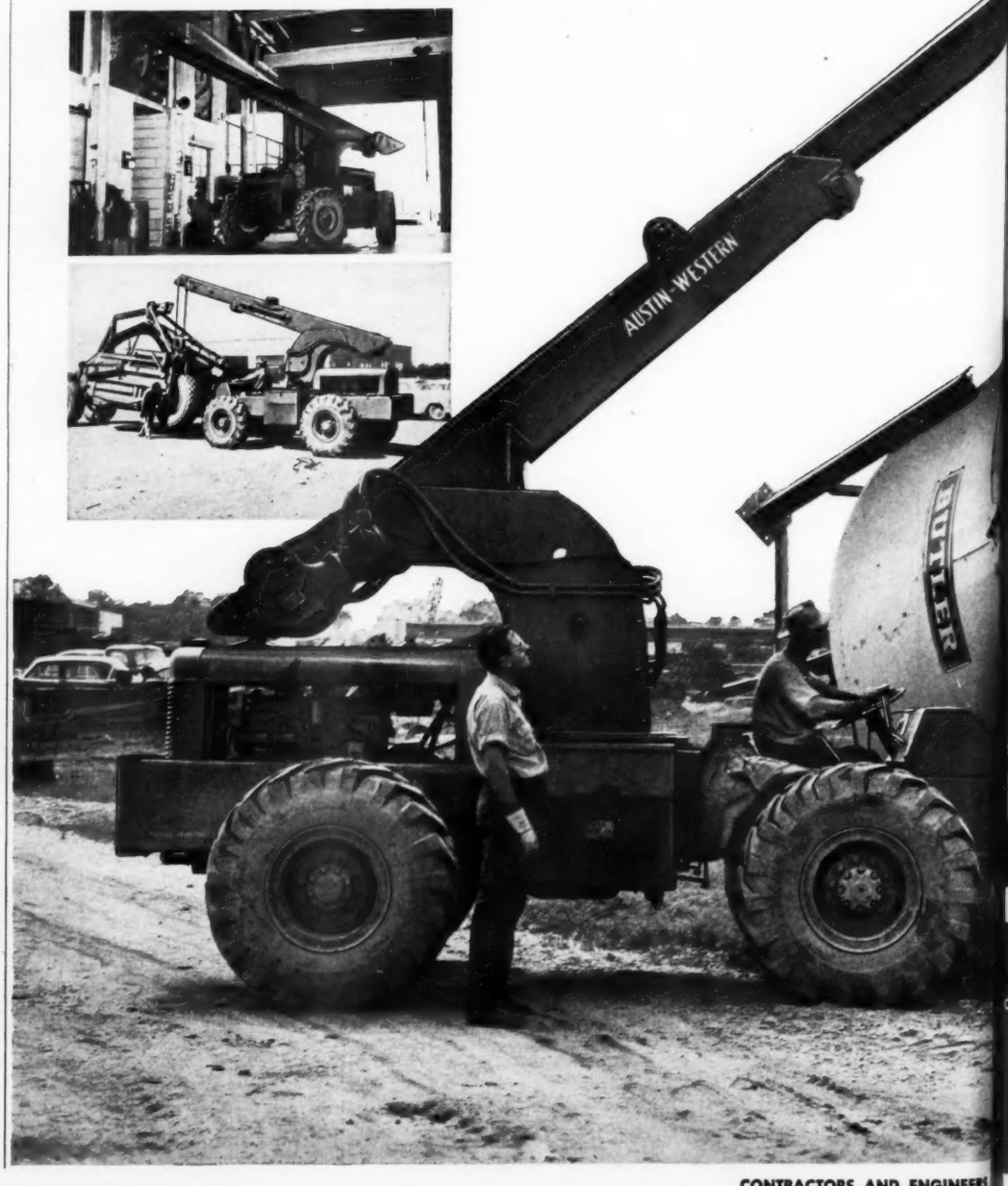
■ A hand-operated winch hoist that weighs only 9 pounds but has a capacity of 1½ tons is shown in literature from Lug-All Co., Haverford, Pa. The ratchet-type hoist is used for pulling, lifting, lowering, moving, tightening, and stretching operations at any angle. In construction, it is used for such diverse applications as installing and moving heavy equipment and pulling stumps.

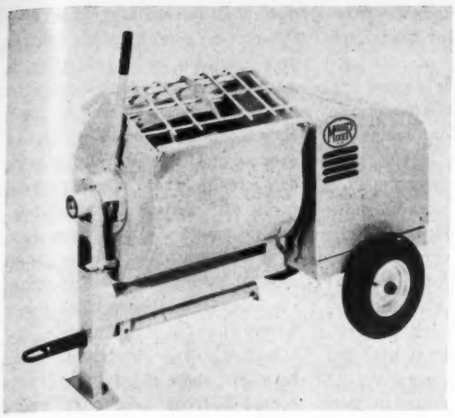
The Lug-All hoist has no brakes to slip because an interlocking pawl arrangement holds the load at all times. Loads are backed off automatically. If excessively overloaded, the reversible safety handle will bend before any other part of the winch approaches its breaking point.

To obtain Form 116A write to the company, or use the Request Card at page 18. Circle No. 247.

AUSTIN-WESTERN HYDRAULIC CRANE

"Handiest Too





Muller plaster and mortar mixers are now available in units rated at 2 to 10 cubic feet.

Changes in ratings of plaster and mortar mixers

■ Changes in the rated capacities of its plaster and mortar mixers have been announced by Muller Machinery Co., Inc., Metuchen, N. J. The units are now rated at 2, 4, 6, 8, and 10 cubic feet for either plaster or mortar.

All sizes will continue to be equipped with the Muller Everlasting paddle-shaft seal, which the manufacturer claims has reduced replacements of paddle shafts and bearings.

For further information write to the company, or use the Request Card at page 18. Circle No. 277.

Two models of the Klein-Logan stripping bar.

Stripping bar easily removes concrete forms

■ A stripping bar tapered to remove forms from concrete faster and more easily has been placed on the market by Klein-Logan Co., S. 13th and Breed Sts., Pittsburgh 3, Pa. Forged from high-carbon fine-grain hexagon steel, the bar has long tapered ends that are easily inserted between the concrete and the wooden form.

Offered in sizes of 36, 42, and 48-inch length, the bar is available in a model with a handy claw at one end for removing nails.

For further information write to the company, or use the Request Card at page 18. Circle No. 337.

Engineering details on moving rubber sidewalk

■ A pamphlet describing moving rubber-sidewalk installations has been released by B. F. Goodrich Co., Industrial Products Division, Akron, Ohio. Giving engineering details, the pamphlet pictures and describes Powerwalk belts. One of those shown, a rubber conveyor belt less than seven feet wide, can carry up to 15,000 people an hour.

Powerwalk belts are said to offer many possibilities for use in large buildings—particularly in airline, bus, and railroad terminals—and in industrial plants.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 205.

All-wheel-drive trucks

■ All-wheel-drive trucks available from Marmon-Herrington Co., Inc., 1519 W. Washington St., Indianapolis 7, Ind., are illustrated in a new brochure from the company. The literature shows Ford chassis converted to all-wheel drive.

Features of the trucks include constant-velocity universal-joint steering ends, full-floating front driving axles, heavy-duty truck engines, heavy-duty synchro silent transmissions, strong reinforced frames, and gear-driven auxiliary transmissions.

To obtain Booklet No. 550301 write to the company, or use the Request Card at page 18. Circle No. 303.

...ou Ever Saw..."

Says Contractor CHARLES SUDGEN

PRESIDENT SUDGEN-SIVIER, INC. OAK-PARK, MICHIGAN

"In its first year's use, our Maintenance Superintendent says his Austin-Western Crane is the handiest piece of equipment we have, and that we simply couldn't get along without it."

"Our Austin-Western Hydraulic Crane is on the job every hour of our two shifts . . . it is making service records and saving downtime to the tune of hundreds of dollars a month."

"Six men used to load a motor on a truck with a hand hoist, but one man with the Austin-Western does it in a fraction of the time."

". . . in addition to changes of engines out on the job, speedy change of tires and such feature jobs, it is a labor-saver in the maintenance shop in its own right."

". . . has never given us any trouble in warm or cold weather and works as perfectly now as it did when it was new."

". . . it is like sending two men to do a job that from four to six men could not do as well or as quickly."

"Savings of thousands of dollars in reduced downtime on a hundred pieces of equipment, maintained better and faster, is just one of many bonus savings."

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WEATHER CHARTS

The weather outlook for August

The accompanying four maps, prepared for CONTRACTORS AND ENGINEERS by Weather Corporation of America, give the average weather picture for August by indicating the average occurrence of precipitation, temperatures of 90 degrees or higher, and thunderstorms for the month.

The numbered black lines indicate the average number of days on which the weather condition represented by the particular chart may be expected to occur. When the number of days is given as a decimal value, such as .5, .25, or .1, the condition may be expected to occur only once every 2, 4, or 10 years, respectively, in the areas through which these lines are drawn.

If a contractor wants to determine how many full working days he may expect next month in the Philadelphia, Pa., area, he may do so by consulting Chart 1. Since Philadelphia lies between lines marked 10 and 12, he will conclude that there will be an average of 11 days of rainfall in that area. If he wants the odds in his favor with respect to completing a job, he should assume that there will be more than 11—say 13—days with rainfall during the month. By thus overestimating the weather risk, he is reducing his lost-time risk.

Rather than represent specific forecasts, these charts give averages compiled from records of weather stations all over the country. The information they contain will help contractors to plan their work.

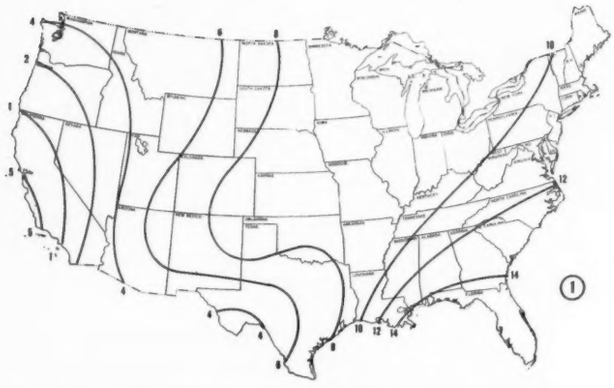

Chart 1. Days with .01 inch or more of precipitation.

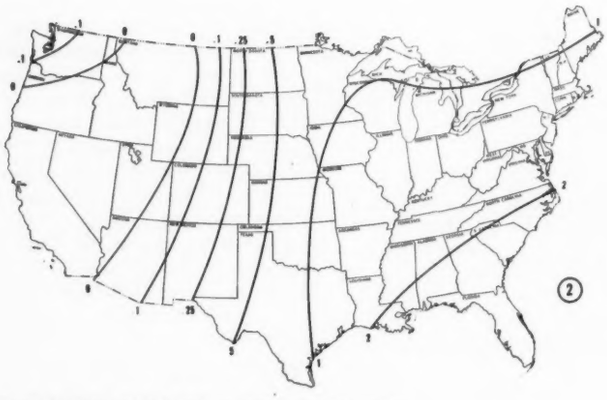

Chart 2. Days with 1 inch or more of precipitation.

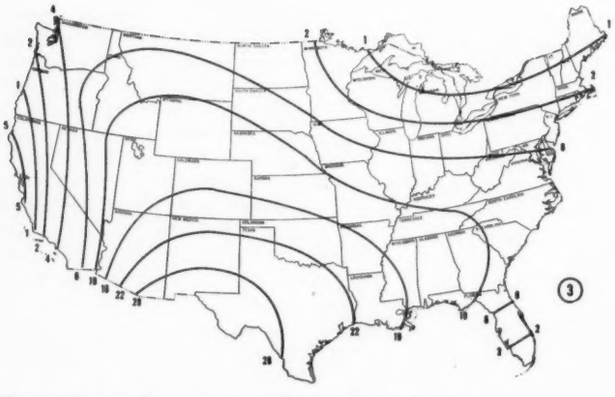

Chart 3. Days with temperatures of 90 degrees or higher.

Chart 4. Days with thunderstorms.

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COMPLETE WITH FLASHING LIGHT AND BATTERY

FOR NO MORE THAN THE OPERATING COST OF ONE KEROSENE TORCH

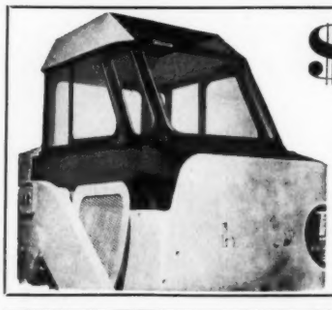
NEO-FLASHER STEEL BARRICADE UNIT – MODEL A
Equipped with reflectorized steel panel, Neo-Flasher Model 1-100 LSR, tamperproof switch and locking device. Your name plate at slight extra charge.

NO MESSY KEROSENE • NO STORAGE PROBLEMS • NO BARRICADES TO BUILD • NO CAPITAL INVESTMENT • NO WEEK-END PREMIUM LABOR

NEO-FLASHER MFG. CO.
(Formerly — LIGHT PRODUCTS, INC.)
3210 VALHALLA DRIVE • BURBANK, CALIF.

PREFERRED by CONTRACTORS
Less initial cost — Lower upkeep
1½ HP to 5 HP
MARVEL CONCRETE VIBRATORS
GV-1, GV-2 & GV-3 MODELS NOW EQUIPPED WITH AUTOMATIC CENTRIFUGAL CLUTCH AS STANDARD EQUIPMENT. INTERCHANGEABLE FLEXIBLE SHAFTS.
Write for full information

MARVEL EQUIPMENT CORPORATION
215-217 EAGLE ST. • B'KLYN 22, N. Y.



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Time and Money! !
Get maximum use from your tractor. No work stoppage due to weather conditions.
Campbell Cabs afford full protection from the elements, full visibility and full production. They are constructed with light weight safety glass throughout. Cabs are available for most tractor models.
Contact your Industrial Tractor Dealer or write direct to: **Campbell Detachable Cab Co., Wauconda, Illinois.**

GIVE TO CONQUER *Cancer*

Aluminum swing stages and scaffold planks

■ A line of aluminum swing stages and scaffold planks with a rated and tested load-carrying capacity is being produced by the Louisville Ladder Co., 1101 W. Oak St., Louisville 10, Ky. The concern emphasizes that this equipment has a specified load rating based on simple-to-use standards developed by the company.

The total load-carrying capacity is determined by the use of a safety factor of four multiplied by the safe working load. For example, each 1,200-pound-capacity unit will carry a safe center-concentrated load of 300 pounds.

The high load-carrying ability of these products is a result of the shape of the side rails, and, also, of a specially-designed boss for securing the rungs to the side rails.

Over-all weight is kept low by the use of a C-shaped channel decking with a knurled surface and longitudinal ridges. Decking is suspended over the rungs. Lengths of 24 feet are attained without trussing.

The complete Louisville line includes step ladders, platform ladders, trestles, A-jacks, rolling scaffolds, and heavy-duty extensions, in addition to the new American standard ladders, swing stages and scaffold planks.

For further information write to the company, or use the Request Card at page 18. Circle No. 305.

Used for pouring concrete, placing forms, backfilling, and various odd jobs, this Schield Bantam C-35 crane received chief credit from the contractor for finishing a building job three months ahead of schedule.

Crane's versatility cuts building schedule

Thanks in large part to the versatility of a Schield Bantam C-35 crawler-mounted crane, the new gymnasium for the Santa Maria Union High School District in California was completed 3 months ahead of schedule. The De Witt Construction Co., San Fernando, Calif., equipped the Bantam unit with a 40-foot heavy-duty crane boom, clamshell bucket, and ½-yard Gar-Bro concrete bucket. The crane was used to pour all the concrete for the walls of the structure, to move and place concrete wall forms, and to backfill footing excavations.

During the job, the Bantam alone handled the pouring of over 2,600 yards of concrete and backfilled 600 to 800 yards of material, as well as doing various operations which formerly required hand labor.

De Witt attributed much of the saving on construction time to Bantam's independent travel, power boom hoist, and maneuverability, as well as to the ease with which the Bantam moved into and out of cramped working space to handle its jobs.

End-dump wagon compared with other earthmovers

■ A catalog describing the features of the Movall wagon for Caterpillar DW20 and DW21 tractors is now available from C & D Mfg. Co., Perkins, Calif. The booklet features a comparison chart showing how Movalls, scrapers, and side, bottom, and end-dump wagons rate against 11 features of a hypothetical ideal hauling unit.

The advantages of the Movall's positive ejection and controlled dumping and spreading of rock, mud, dirt, and aggregate are described.

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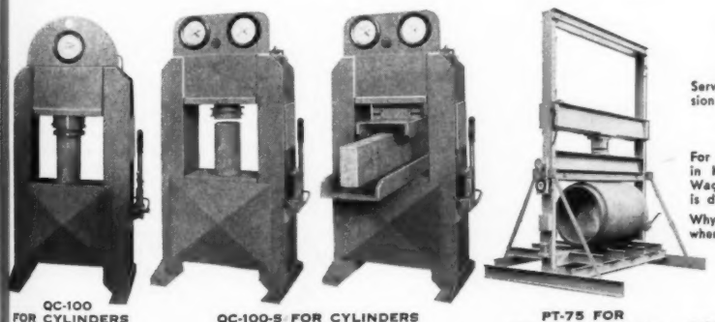

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★Just turn the high pressure hose on that heavy equipment for a quick clean-up. The solid, hard, driving, high pressure stream from a Hardie Powered Pump Unit will strip off the caked mud, grease, dirt—even that "behind the ears"—in a matter of seconds.

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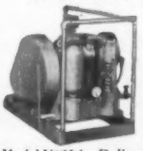
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MANUFACTURER MEMOS

Gorman-Rupp news

The new South-Central District representative for the Gorman-Rupp Co., Mansfield, Ohio, is Robert L. Sears, who has been associated with the pump manufacturing firm since last year. He will be in charge of G-R factory-dealer relations in the lower Mississippi Valley and Delta areas, operating out of Memphis.

Associated with the F. E. Myers & Bros. Co., Ashland, Ohio, before joining Gorman-Rupp, Mr. Sears has had more than seven years experience in the pump industry.

Ford D. Brown has been named eastern representative of the Gorman-Rupp Co. Mr. Brown's territory covers the area from metropolitan New York through eastern Virginia.

Directing sales for Marion Power Shovel Co., Marion, Ohio, is Robert Campello.

Robert Campello named Marion sales manager

Sales of all Marion machines in the U. S. and Canada are now under the direction of Robert Campello, the new sales manager for Marion Power Shovel Co., Marion, Ohio.

Before working for Marion, Mr. Campello was associated with Bucyrus-Erie Co., South Milwaukee, Wis., in a number of sales capacities, and as manager of the firm's Washington, D. C. office. Previous to that, he was with Tractor & Equipment Co. and the H. O. Penn Machinery Co. in New York, N. Y.

Clark names two to board

In a recent move to increase the firm's board of directors from 15 to 17 members, shareholders of the Clark Equipment Co., Buchanan, Mich., elected C. H. King and D. H. Ross to fill the newly created positions.

Mr. King, a member of the Clark organization since 1925, is vice president of the company's automotive division. Mr. Ross, formerly treasurer of Ross Carrier Co. and Michigan Power Shovel Co. prior to their acquisition by Clark in 1953, is now assistant to the president of Clark.

The new central regional sales manager for the industrial truck division of Clark Equipment Co., John J. Mlynski, will supervise sales of material-handling equipment manufactured by the Buchanan, Mich., firm. He will work from headquarters in Chicago, Ill.

Ralph Cole, appointed to handle field service work for the Ross straddle carrier, will make his headquarters in Benton Harbor, Mich.

Wm. Bros elects director

Newly elected to the board of directors of the Wm. Bros Boiler & Mfg. Co., Minneapolis, Minn., is A. O. Williamson, manager of the company's road machinery division. With the company for 20 years, Mr. Williamson started as a chief draftsman in the division and was later promoted to product engineer.

Though mainly occupied with sales at present, Mr. Williamson has played an important role in the development of several inventions in the road-equipment field. At present, he is consulted on new design and method ideas by the engineering department of the Bros firm.

A. O. Williamson, a new director of Wm. Bros Boiler & Mfg. Co., Minneapolis, Minn.

"Best Front End Loader This County Ever Had"

CALICHE BASE FOR A NEW ROAD in Bee County, Texas, is obtained from leased pit near Skidmore. INTERNATIONAL DROTT TD-9 Skid-Shovel loads out all the material needed for building and maintenance along county's 450 miles of roads, keeps four trucks busy hauling.

Bee County, Texas, cuts materials handling, excavating cost with INTERNATIONAL DROTT Skid-Shovel, according to County Commissioner H. F. Speikerman

Materials handling, sewer and gutter excavation, ditching and stockpiling start the long list of jobs handled by the INTERNATIONAL DROTT TD-9 Skid-Shovel owned by Bee County, Texas.

"There's just nothing that this Skid-Shovel can't do," according to County Commissioner H. F. Speikerman. *"Any type of loading work or any small excavating job is done much better, much faster and with much less expense by this unit.*

"We saw all the tractor-mounted front-end loaders in operation but none of them could match the performance or the production of the INTERNATIONAL DROTT *TD-9 Skid-Shovel."*

Only with INTERNATIONAL DROTT Skid-Shovels do you get the benefit of Skid-Shoes which utilize the lever principle to provide 300% greater bucket break-out or digging force. Heaped loads are transported at ground level . . . and in high gear . . . on the Skid-Shoes, which take wear and carrying strain off the tractor.

The exclusive and patented Hydro-Spring absorbs 70% of the shocks normally encountered in front-end loaders, extends the life of the equipment, makes operating far easier.

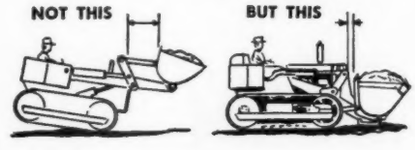
INTERNATIONAL DROTT Skid-Shovels are available in four sizes. For the unit best suited to your job, call your International Industrial Power Distributor today.

PRY-ACTION BREAK-OUT

3,000 to 9,000 lbs., all on front of tractor

9,000 to 27,000 lbs., all on loader shoes on ground

SKID-SHOE TRANSPORTATION



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INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

Gar Wood's new vice president and director of sales and advertising, Milton G. Peck.

Milton G. Peck appointed a Gar Wood vice president

Gar Wood Industries, Inc., Wayne Mich., has made Milton G. Peck vice president and director of sales and advertising. He had been with the electric industrial truck division of Clark Equipment Co., Buchanan, Mich. for the past four years. Mr. Peck also was sales manager of the industrial truck division of Yale & Towne Mfg. Co., Philadelphia, for 26 years.

Mr. Peck's sales activities will be concentrated on the line of truck equipment and accessories, dump bodies, hoists, crawler and truck-mounted shovels and cranes, ditchers, spreaders, foundation borers, and allied products manufactured by Gar Wood.

Baldwin-Lima-Hamilton makes executive changes

A recent series of executive changes at Baldwin - Lima - Hamilton Corp., Lima, Ohio, has resulted in the election of McClure Kelley as president of the firm. Mr. Kelley's predecessor, Marvin W. Smith, becomes chairman of the executive committee, and George A. Rentschler is chairman of the board of directors.

Two vice presidents were also elected. Robert G. Tabors, assistant general manager of the Hamilton Division, and Arthur Clements, vice president and general manager of the Hamilton Division's clearing machine corporation, were named to the posts. The four new directors are J. F. Connaughton, Erwin Loewy, James F. McGraw, Jr., and William F. Rockwell. Thirteen directors were re-elected.

Fairbanks, Morse opens new regional office

A new sales and service headquarters for a seven-state area has been opened in Fair Lawn, N. J., by Fairbanks, Morse & Co., engine, pump, and power-mower manufacturer of Chicago, Ill.

The new 50,000 square-foot facility will serve Connecticut, New York, New Jersey, eastern Pennsylvania, Maryland, Delaware, and Virginia. The company's export division sales offices are also located in the new building.

New officer is elected by Raymond Concrete Pile

The new president and managing director of Raymond Concrete Pile Co., Ltd., Toronto, Canada, is Wesley C. Pietz. The firm is a subsidiary of Raymond Concrete Pile Co., a foundation and heavy-construction company of New York, N. Y.

Mr. Pietz, with the Raymond organization since 1927, succeeds Julian A. Dickinson in the post. Mr. Dickinson will continue to serve as president of Raymond International Co., Ltd., Toronto, and will be responsible for special construction projects.

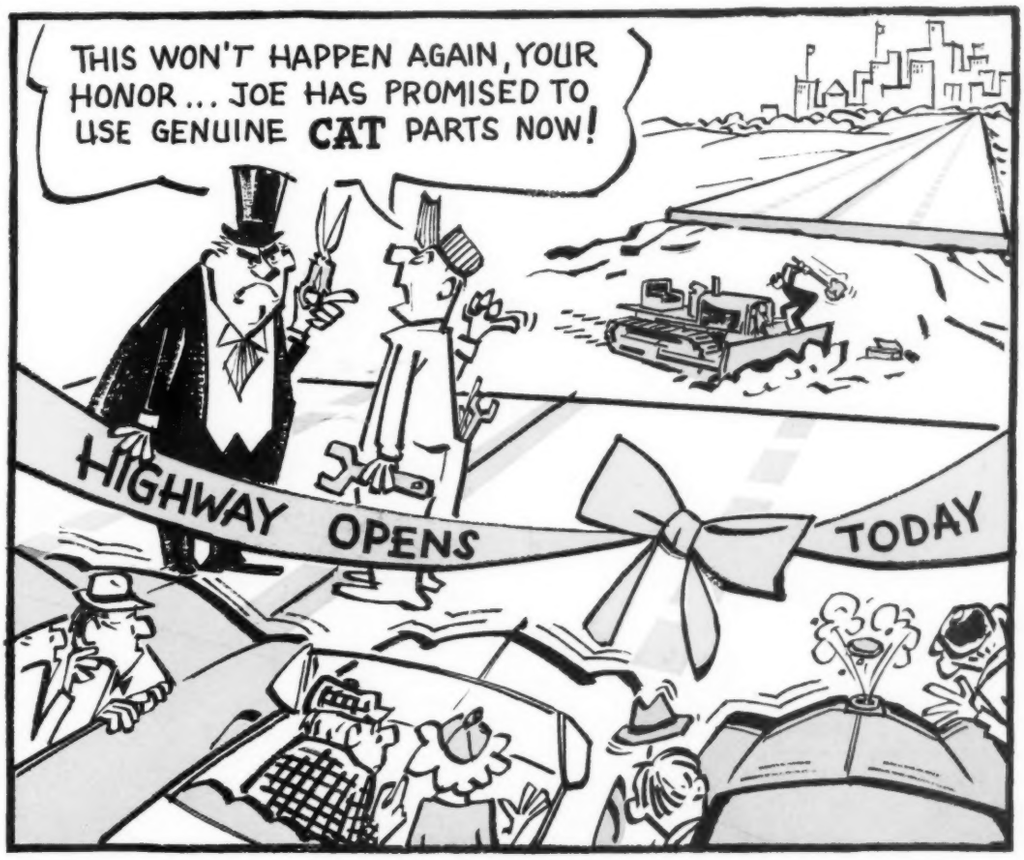
Richard O. Marsh, Jr., and Clifford E. Simmons have been made district managers, the former in Pittsburgh, and the latter in Baltimore.

Richard H. Frizzell, president of the Wire Reinforcement Institute.

WRI elects Frizzell

Richard H. Frizzell, sales manager of the structural products department of the Wickwire Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y., has been elected president of Wire Reinforcement Institute, Inc.

The institute, with headquarters in Washington, D. C., is a nonprofit trade association of the manufacturers and producers of welded wire fabric. As its president, Mr. Frizzell will be responsible for research and education programs for the improvement of welded wire fabric and the product it reinforces, and for the extension of the fabric's use.



Down time can upset *any* schedule. Best way to avoid it is to insist on genuine CAT* parts every time. Then you're sure of getting parts that are made to the latest design, precisely manufactured of the right materials, rigidly inspected and tested.

Take track shoes, for example

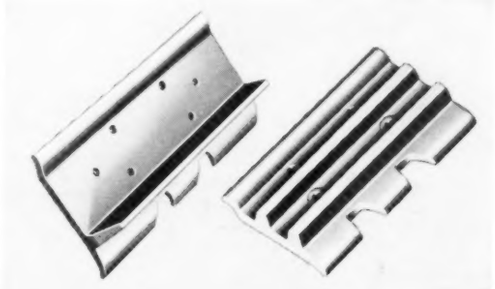
"If the shoe fits, put it on," can often be bad advice. Other makes of track shoes may *fit* all right, but how will they *wear?* It took years of research and field testing to develop Caterpillar's exclusive hardening process which makes genuine Cat shoes wear up to 75% longer than most others. The Cat shoes pictured here (a standard shoe, and a double grouser shoe for roughest rock conditions) are made of specially rolled high-quality steel sections—with a yield strength of 100,000 lbs. per square inch. With a substitute track shoe: who can be sure?

The difference on the job: with genuine Caterpillar-built track shoes you can count on longer work life, there's less replacement, and you get better performance under any working conditions.

With substitute parts: who can be sure?

Better get genuine Caterpillar parts every time.

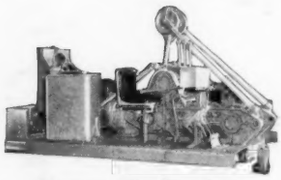
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

Comparison proves the MICHIGAN 3/8-yd. Truck Hoe YOUR BEST BUY



Upper Mechanism

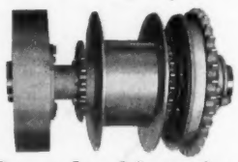
The MICHIGAN® TM-6 is a heavy duty 3/8 yd. 7½ ton upper mechanism for mounting on your own truck or at the factory on a new 6x4 or 6x6 truck. The TM-6 is available on the Clark Lease Plan. Write for Bulletin 111.

Power Control

Air Controls are standard on all MICHIGANs . . . fast, smooth, precise, with low operator fatigue. No heavy levers to push or pull—air rams do the actual work.

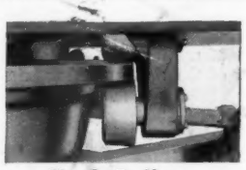
Smooth Clutches

There's nothing smoother than MICHIGAN air-operated segmented disc clutches . . . and they are self-compensating for heat, self-ventilating and self-cleaning. All segments are interchangeable.



Power Load-Lowering

Four shafts on the TM-6: Swing, Hoist, Intermediate and Crowd . . . each with its independent clutches. For precision crane work, the hoist line can be reeved on the front drum to provide Power-Up and Power-Down.



Hook Rollers

You can swing the boom by leaning against it. There are 5 ball bearing-mounted adjustable rollers on the TM-6 . . . grease twice a year. Most other 3/8-yd. machines have only 3 rollers, bushing-mounted.

Cast Steel Circle Gear

Center post and circle gear is heavy one-piece casting of alloy steel. Pinion gear is cut from alloy steel for smooth, quiet operation. Roller paths are machined to a smooth finish, top and bottom.

Write for 12-page booklet, "More Yardage through Air Power" which documents the operating and maintenance advantages of MICHIGAN air controls.

CLARK EQUIPMENT

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Construction Machinery Division
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